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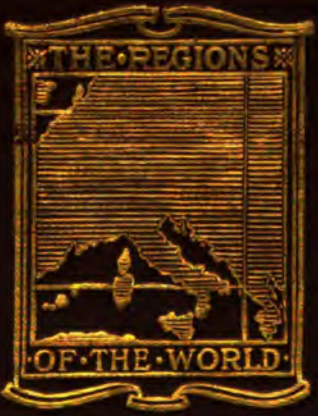
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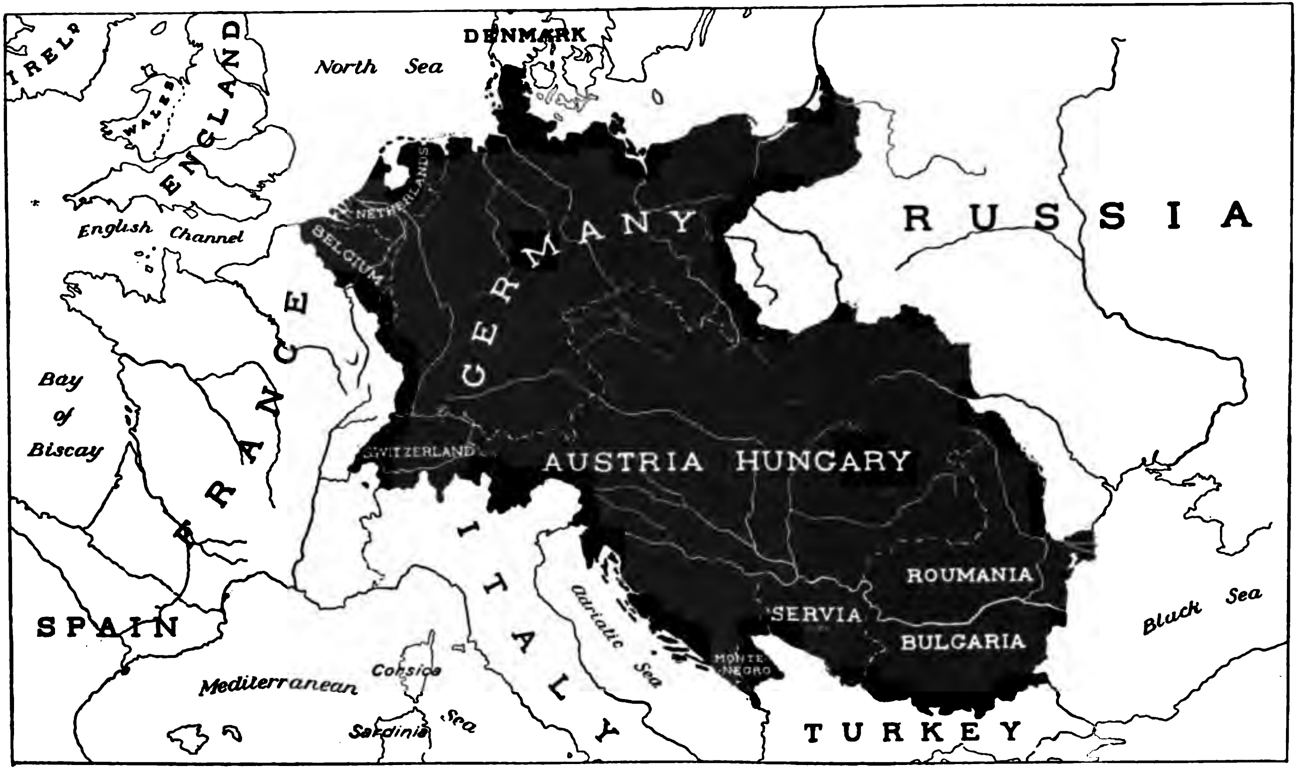
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CENTRAL EUROPE

CENTRAL EUROPE

BY

JOSEPH PARTSCH, PH. D.

PROFESSOR OF GEOGRAPHY IN THE UNIVERSITY OF BRESLAU

With Maps and Diagrams

UNIV. OF CALIFORNIA

THE REGIONS OF THE WORLD

NEW YORK
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1903

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EDITORIAL NOTE

Professor Partsch's manuscript was translated by Miss Clementina Black. It was found to be too long for publication in an English series, and the translation was therefore curtailed by Mr. E. A. Reeves. In the shortened form it received the comments of the author, and the proofs were finally corrected by the editor, who is therefore alone responsible for any errors of diction. The editor desires to thank Miss Black and Mr. Reeves for their most efficient help. Above all is he grateful to Professor Partsch for permitting the alteration of the work to meet the requirements of Anglo-Saxon readers. The book will be published in German in the original form.

H. J. M.

M599739

PREFACE

WHEN Mr. Mackinder asked me, in 1897, to undertake the volume dealing with Central Europe, in his new Geographical Series, The Regions of the World, he and I were agreed that, in order to secure the unity of the whole work, the plan and division of the material must be settled by the editor for the guidance of his fellow-workers. My German manuscript was completed in September 1899, but when, in the beginning of 1901, the English translation had been finished, it appeared that it had run to rather too great a length. Some abbreviations had to be made in order to reduce it to the usual size of the books proposed, and to bring its proportions more fully into accord with the volume on "Britain and the British Seas," which was published in the early part of 1902. For German readers, the German edition now in preparation will retain the unabridged text as originally written.

The diagrams and sketch maps in the text were prepared by the author, and executed by Messrs. Darbishire and Stanford. The coloured maps have been specially drawn for this book by Mr. J. G. Bartholomew.

My particular thanks are due to all the gentlemen who have participated in the preparation of this volume, but more especially to Mr. Mackinder for his kindly interest in it.

In the revision of the English manuscript, and of the printed proof, my son Joseph, stud. jur., has been my faithful helper. J. P.

BRESLAU, *Jan.* 1, 1903.

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⁂ Erratum in *Map vi. The blue indicative of the Romance Stock should have extended over the area crossed by the word "Wallons."*

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CENTRAL EUROPE

CHAPTER I

POSITION AND WORLD-RELATION

THE claim of Europe to be regarded as an independent continent does not rest upon the great area of its Russian territory, with the long boundary towards Asia, but rather upon the group of its western peninsulas and islands, enclosed and divided by gulfs. These many, variously shaped members are, however, only welded into a geographical whole by the mass of Central Europe lying in their midst. Its well-marked outline and independent destiny are due to the important fact that two depressions in the body of the mainland—the Baltic and the Pontic—have had access to the ocean through the sinking of their outlets. On the line where these two slightly salt basins of the Baltic and Black Seas come nearest together, the line between Pillau and Odessa, the continent narrows suddenly from 1600 miles to 800. Here, also, the watershed falls exceptionally to less than 500 feet, and it was an easy matter for the bold Varangians to transport their skiffs from sea to sea. It is in this region that the eastern boundary of Central Europe must be sought. Here begin sharp changes of distance between its northern and southern coasts. Narrowings of the mainland occur between Stettin and Trieste, between Antwerp and Genoa, and between the mouths of the Seine and the Rhone. Much closer, however (250 miles), is the approximation of the Ocean and the Mediterranean Sea to the north of the Pyrenees. There is a strong temptation to transfer thither the other boundary of Central Europe. Unquestionably France has a certain share in the heart of the continent. Yet it must not be entirely included. Two great distinctions mark it off. France enjoys contact with the expanse of the open ocean, as well as unimpeded freedom of communication between the Atlantic and the Mediterranean; and only on the eastern boundary of France do the characteristic mountain formations of Central Europe appear in force.

The most conspicuous feature of the configuration is the development of the great Alpine system. It is by the Alps, the Illyrian chains, the Carpathians, and the Balkans that the divisions of Europe are fixed, its countries held asunder, and their ethnological and political independence assured. By them, in particular, the Mediterranean and the two peninsulas which were the favoured scenes of ancient culture are cut off from Central Europe. The mighty mountain barrier, from the western foot of the Alps to the eastern extremity of the Balkans, is the basis of Central Europe. Within its domain must certainly be included the northern slope of the Alps and Carpathians, as far as the waters flow from these heights. The Romans reckoned the Rhine and the Vistula as the boundaries of Germany. These frontiers may have corresponded fairly well with the ethnography of that period, but they will not suffice for the physical geographer: he must rest his boundaries upon features of more permanence.

The tract of country lying between the Alpine ridges and the northern seas possesses no natural unity. It falls into two bands, of which the southern, that of the inferior mountain-chains, stretches over from France, and the northern, that of the lowlands, from Russia. The threefold belt of Alps, inferior chains, and northern lowlands, controls the landscape and scenery of Central Europe. Wherever one of these elements dies out, Central Europe comes to an end. Its most westerly point is therefore marked by the western end of the great lowland at Dunkerque, and the landmark of its eastern border is the Polish upland at Sandomirz. On the west, the Ardennes and the Vosges, while helping to enclose the basin of Paris, situated to west of Central Europe, suffer the Meuse and the Moselle to pass through and to meet the Rhine. These mountains and the Jura chain, a branch of the Alps, form the western boundary of Central Europe, broken through by openings for the intercourse and the warfare of nations. On the east the plain of North Germany lies open to that of Russia. Only arbitrary boundary-lines can be drawn on this side. The middle Vistula, which flows round the mountains of Sandomirz, might be regarded as a natural boundary, but not the lower Vistula. The lake plateau of Pomerania finds its evident continuation in that of East Prussia, and the great valley of the Warta and the Netze, bounded on the north by the Pomeranian heights, may be followed along the Vistula, the Narew, and the Bobr, into the vicinity of the Niemen.

From these natural boundaries of Central Europe the political boundary of its states seldom remains far distant. It extends beyond them in German Lorraine, and in parts of Bulgaria and Galicia; it remains within them in Poland and the peninsula of Jutland.

The wide tract of land between Ostend and Geneva, between Memel and Burgas, forms at the present day the core of the European group of states. This whole tract only came into the foreground of general history in the Middle Ages. It was touched only in part by the influences of ancient civilisation. Only from the two ends of the mountain barrier, from Massalia and from Olbia, the predecessor of Odessa, did Greek commerce put forth weak feelers towards the centre of the continent. The Romans were the first to surmount the Alps. On the other side of the Danube they long ruled the Rhenish mountains; they ruled Transylvania for 150 years, and only the early death of Marcus Aurelius prevented the subjugation of Bohemia. This event was the turning-point that left the Central European dominion of the

Romans uncompleted, and allowed the Germanic races to gather strength and to break into fragments the Roman Empire. Not until this effective interposition of the Teutonic peoples does European history begin. Until that time the western countries of Europe, including the British Isles, seemed destined to a meagre provincial life as mere dependencies of the Mediterranean empire, while those of the east were entirely withdrawn from the horizon of the civilised world. With the entrance of Central Europe into history begins the foundation of the European group of states.

The leading place among them was not, however, reserved to the Teutons alone. The great extent of their conquests consumed the diminishing powers of the wandering Germanic peoples. Even the renewed growth of strength in what remained of their old home, between the Alps and the North Sea, the Elbe and the Meuse, did not suffice to make up the losses of the long migratory period. Not only the lowlands of the east, but also the interior of Bohemia were invaded by the Slavs, and the Hungarian plain by the Magyars. Thus, even at this day, may be found in the heart of the continent, Teutons, Slavs, and peoples of Romance stock, as well as a powerful outpost of the Uralo-Altaic races. The emulation and the conflicts of these various races form a substantial part of European history. Upon the strength and independence of the states founded by them depends the equilibrium of Europe—the welfare and stability of the European group of powers. The idea that Europe might one day be half Jacobin and half Cossack was a chimera to which the future will never return. True it is, undoubtedly, that the social and political dimensions of life grow gradually larger. But it does not follow that the colossal empires of Great Britain and Russia, whose future balance will only be maintained by the development of the United States and by the vast population of Eastern Asia, are destined gradually to subjugate or absolutely to absorb the less spacious powers of Central Europe. The course of the world's history does but warn the Central European states to draw socially closer together, and to subordinate lesser dividing political interests to the greater aims of maintaining to the full their independence, and that wealth of social and intellectual culture which has given to Europe the first place among the continents of the world.

This faith in the future is strengthened by a glance at the natural endowments of Central Europe, and at the additional value given to them by the labour of its peoples. Its extent is not insignificant; it occupies a sixth part of the surface of Europe, and contains one-third of the whole population of the continent. Its position, between 42° and 55° north, ensures to the whole tract a climate which inclines the inhabitants to activity, and also rewards their pains. The variety of conformation creates a group of localities, differing greatly as to warmth and moisture; and these differences, co-operating with considerable variations of soil, produce, in one part or another, conditions favourable to every branch of cultivation. Woodlands rich in game, excellent corn-lands, grazing for horses, low-lying meadows and mountain pastures for the finest of live stock, and orchards and vineyards succeed one another; and the portions which, owing to altitude, sterile and rocky soil, sand-drifts, want of water or marshiness, are permanently unprofitable, are but limited in extent. In the north-west of Germany there are wide tracts of bog and heath, while of the great inland district east of the Elbe, and of the plain of Hungary, a considerable part is sandy and naturally unproductive. The soil, however, is, almost everywhere, susceptible of improvement. By thorough culture, good irrigation, and the addition of valuable chemicals to develop its nutritive qualities, it has been so much improved, that, in many places, its original poverty can hardly be traced beneath the rich cultivation. In other points, as in this, the natural gifts of Central Europe are not in general brilliant and superabundant, but solid and capable of being developed by earnest endeavour.

Central Europe has no superfluity of minerals, least of all of precious metals, but the German miner has dealt so perseveringly and so circumspectly with the modest mineral wealth allotted to him, that in matters of mining and metallurgy he has been the teacher of other nations. Fossil fuels and iron alone, which supply laborious nations with the best foundation for industrial progress, are present in rich abundance.

The rivers of Central Europe are neither so free from obstacles as the Seine and the Thames, nor so secure from obstruction by frost; but care and attention have made them navigable for the most active internal commerce of the continent, and rendered them a very valuable complement of the extensive network of railways. Internal communication being thus developed, it becomes possible to utilise to the utmost the advantages of a position in the midst of the countries of the continent, and in close contact with all the actively progressive nations. With all of these Central Europe is engaged in a constant interchange of products and labour.

Unquestionably, the violent interference of neighbours in her affairs has also caused Central Europe often enough to feel severely that there are drawbacks in being thus enclosed by other nations. The land being broken up by complex mountain systems and by rivers flowing in different directions, political division, for a time, became excessive, and long prevented sufficient accumulation of strength for effectually repelling such interference, even when it came from lesser powers. Only a conviction that no sacrifice is too great for the maintenance of independence and a willingness to accept heavy military burdens can save the peoples of Central Europe from the recurrence of this danger. Certain it is that these peoples, with their flower of physical strength hardened by climate and steeled by toil, have the power, if they earnestly choose to exercise it, of securing peace to all Europe.

In this peace Central Europe herself has the most vital interest, for only while peace continues can Central Europe hope to lighten, and even, by the expenditure of much exertion, to remove the pressure of an additional drawback belonging to her central position—that of exclusion from the open ocean. The Black Sea, indeed, provides the lower districts of the Danube with an important channel for the exchange of their agricultural products against the wares of the outer world. To Hungary also it has become of growing importance, since the difficulties of navigation at the Iron Gates were overcome. But even for Hungary, and still more for Austria, approach to the inner corner of the Adriatic is of more value than access to the remote *cul-de-sac* of the Pontic basin. If the Danubian Empire is to retain its position in the world, Trieste and Fiume are indispensable outlets. Spalato and Ragusa, too, are destined to become so. In our days the Dalmatian shore must not remain a coast with no country behind it. But however brilliantly the prospects opening here may be fulfilled, the Adriatic itself will still be but a branch of an inland sea, whence the ways of access to the ocean remain long, narrow, and held by other hands.

To the greater part of Central Europe the access of Germany to the sea is of infinitely more importance. This access is modest enough. The maritime position of Germany is by nature more unfavourable than that of any other country of Western Europe. As far as the trade of the world is concerned, the Baltic Sea, even since the opening of the Baltic and North Sea Canal, can only be considered as holding a secondary place. It is only the ports of the North Sea whose situation enables them to compete directly upon the Atlantic—the principal stage of international commerce—with the modern maritime nations. But enterprise, perseverance, and integrity have so utilised the modest opportunities allotted by nature, that the German merchant-service stands second in Europe only to that of Britain, while France and Spain, two countries far more favoured in this respect by nature, have been far outstripped in commercial development by Germany. If we add the old and well-established sea traffic of Holland, we shall find the position of Central Europe in international commerce far more favourable than could be expected from the extent, position, and nature of its coast-lines. The Netherlands have retained valuable colonial possessions, won in their brilliant period of maritime supremacy, and brought by intelligent tendance to a high degree of agricultural prosperity. Late in the day, when the world had already been allotted, Germany too entered the field of colonial enterprise, and now devotes herself to systematic development of those rather poorly endowed foreign possessions over which her flag flies.

When we perceive with what activity the peoples of Central Europe labour to develop the natural gifts of their countries, we are confirmed in the conviction that this centre of Europe is great enough, and favoured enough by position, climate, nature, and conformation, to hold its independent place for ever among the great powers of the world. This conviction and a perception of how desirable is peaceful co-operation between the natural and national forces here lying side by side, can have no better basis than a consideration of the territory, which, despite all internal variations, despite all links with neighbour territories, will be found to possess marked features of geographical unity.

We have to consider a superficial area of 626,000 square miles, inhabited by over 131 millions of human beings, and in order to get a connected and comprehensive view of facts, we shall find ourselves compelled from time to time to extend our examination across the borders of adjoining countries into France, Denmark, and Russia.

Note on Authorities.—B. G. Mendelssohn's "German Europe," 1836, gives an able general view of Central Europe, illuminated by historical insight.

The *Länderkunde von Europa*, edited by A. Kirchhoff, 1887–1893, contains a "Physical Sketch of Central Europe," by A. Penck. In this standard work, also, the German Empire, the Netherlands, Belgium, and Luxemburg, are dealt with by Penck; Austria and Hungary by A. Supan; Roumania by Paul Lehmann; and Servia, Bulgaria, and Montenegro by Theobald Fischer. In the description of Switzerland Egli was assisted by the geologist, A. Heim, and by Billwiller, the expert upon climate.

The most precise and trustworthy statistical information is given annually by the *Gothaische Genealogische Hofkalender*.

Good general maps of the countries of Central Europe are to be found in the large atlases by Stieler (Gotha), Debes (Leipzig), and Kiepert (Berlin).

Carl Vogel's map of the German Empire, on the scale of 1 : 500000 is a masterpiece of cartographic art. Upon it is founded Richard Lepsius's Geological Map of the German Empire, on the same scale. In both these maps the territories of neighbouring countries are drawn and coloured.

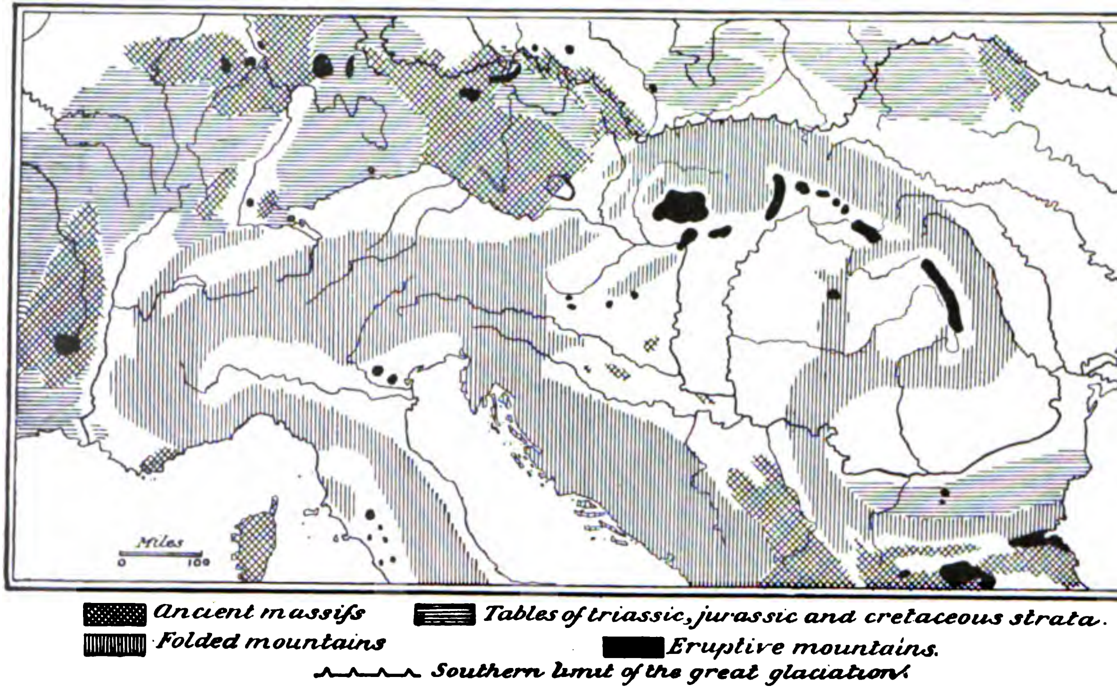

Miles
0
100
▩ Ancient massifs
▤ Tables of triassic, jurassic and cretaceous strata.
▥ Folded mountains
■ Eruptive mountains.
Southern limit of the great glaciation.

FIG. 1.—Mountains of Central Europe

CHAPTER II

GENERAL OUTLINES OF THE PHYSICAL HISTORY

UNITY does not exclude division. The separation of the natural provinces of Central Europe arises from the course of evolution through which its surface has passed. The first stages, indeed, are obscure. The Carboniferous Age affords the earliest glimpse of a low-lying continent recently emerged from the sea (Fig. 2). The position of the marine strata in the coal-deposits of Carinthia, Upper Silesia, Westphalia, Belgium, and northern France shows how the coast-line of this land — upon which the coal-plants grew — fluctuated during the period when the coal-measures of Bohemia, Saxony, Thuringia, the Saar, the Black Forest, and the Western Alps were forming in its interior basins. This continent was the workshop in which great mountains were fashioned. The crust of the earth shrank together in folds of Alpine altitude. But the long course of time once more destroyed these heights, and their trace can only be followed by means of the steeply-inclined strata marking their now level bases. From the Cevennes to the Hartz, the old deposits strike consistently to the north-east. In Belgium alone their trend turns to the north-west, parallel with the old folding of Brittany, while through the greater part of the district of the Sudetes, it runs south-eastward.

Long periods followed, in which slight risings and depressions allowed the sea to flow in now upon one, now upon another part of the Central European continent ; triassic, jurassic, and cretaceous formations spread their deposits over wide and varying regions, and when the sea once more retreated these deposits were in part destroyed and in part remained to cover large tracts of tableland. These tablelands at one time extended unbroken from France to Central Germany, from the upper Moselle to the Saale, and from the middle reaches of the Weser to the Danube. From northern Bohemia, too, at one period a great plateau of sandstone, no less uniform than the plain of North Bulgaria, stretched into the adjoining parts of Saxony and Silesia.

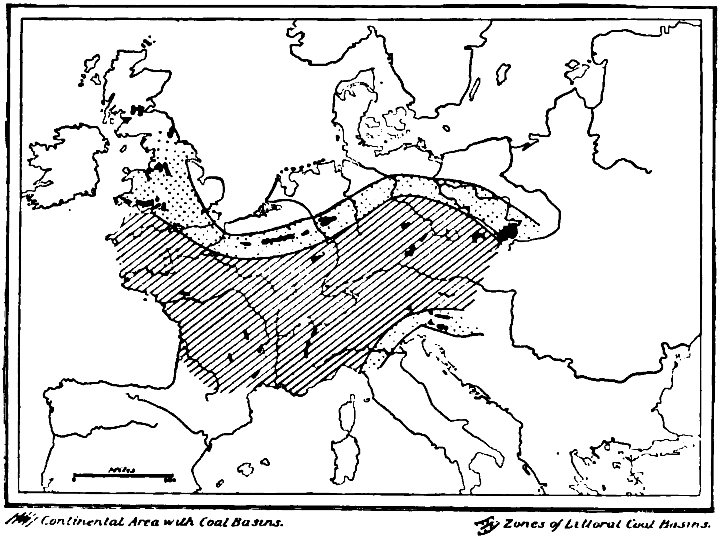

miles
▨ Continental Area with Coal Basins.
Zones of Littoral Coal Basins.

FIG. 2.—The Continental Area of Central Europe in Carboniferous Times.

The further shaping of the land, however, was not left solely to the action of the waters; disturbances of the earth occurred in the Tertiary Period and produced decisive effects upon the configuration of the whole surface. All parts were not equally affected; all did not yield equally to the forces brought to bear upon them. A contrast was produced between the north and the south. The southern part of Central Europe was puckered up by the gradual contraction of the earth's crust into curved mountain-chains, while at the same time marked irregularity was imparted to its contour by the breaking away of great areas of depression on the concave side of the mountain curves. Quantities of volcanic rock were thrown up from the clefts around the deep hollow of the Hungarian plain and formed in some places gentle hills and in others considerable mountains. In the Middle Tertiary (Miocene) Period, while the folding of the mountains was still going on, the great Alpine and Carpathian ring was surrounded on its outer side by a sea which filled the valley of the Rhone and Saône, covered the high plateaux of Switzerland, Bavaria, and Austria, flowed across Moravia, and passing through the Moravian Gate into Galicia, gained an outlet, by way of the Bukowina and Bessarabia, into the Pontic basin.

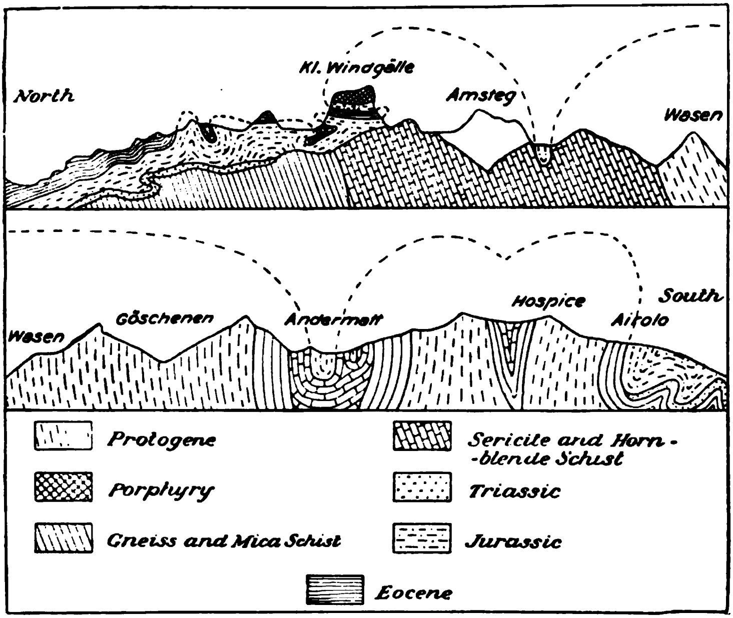

North
Kl. Windgälle
Amsteg
Wesen
Wesen
Göschenen
Andermatt
Hospice
South
Airolo
Protogene
Porphyry
Gneiss and Mica Schist
Sericite and Horn-blende Schist
Triassic
Jurassic
Eocene

FIG. 3.—Section through the Gotthard showing Folded Mountains.

This sea, whose dry bed is furrowed at the present day by great rivers, cut off the Alps and Carpathians from the more northerly portion of Europe, for which a different fate was in store. No mountain foldings befell it; on the contrary large and deep fractures, running in fairly straight lines, cut it up into great blocks, each of which moved independently and rose or fell in varying ways before finally settling down at very unequal altitudes. The block traversed by the Lower Rhine was divided by a great crevasse from the district of the Upper Rhine. This district itself was broken by fissures that ran nearly due south: its middle portion sank into a hollow and formed the great rift-valley of the Upper Rhine, between the two high-lying blocks of the Vosges and the Black Forest. (Fig. 3a)

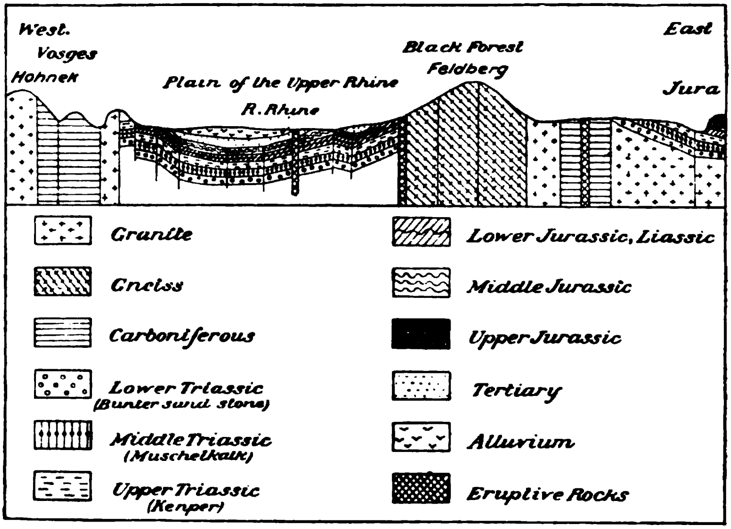

West.
Vosges
Hohnek
Plain of the Upper Rhine
R. Rhine
Black Forest
Feldberg
East
Jura
Granite
Gneiss
Carboniferous
Lower Triassic (Bunter sand stone)
Middle Triassic (Muschelkalk)
Upper Triassic (Keuper)
Lower Jurassic, Liassic
Middle Jurassic
Upper Jurassic
Tertiary
Alluvium
Eruptive Rocks

FIG. 3a.—Section through the basin of the Upper Rhine showing Block Mountains.

Exactly the reverse occurred in the case of the Thuringian forest, which rose on high like a narrow eyrie between the sunken plains of Franconia and Thuringia. The interior of Bohemia formed a depression along cracks that cut off the southern border of the Erzgebirge and the Sudetes. A further character of variety was given to the contour of the land in this part by volcanic influences. A broad belt of trachytic and basaltic elevations runs through the mountains of the Lower Rhine to Hesse, and another zone of basaltic heights from North Bohemia, through Lusatia into Silesia. The surface of this fractured country did not, however, present an altogether irregular aspect. Some signs of unity and of mass were imparted by the prevalence of two main lines of direction (N.-W. and N.-E.) in the network of faultings, and still more decidedly by the clear differentiation of three zones. The two great southerly basins—Bohemia and South Germany—in which the waters of the Elbe and the Rhine are collected, are divided from the still lower-lying regions of the north by a central belt of high ridges stretching from the Ardennes to the Sudetic Mountains.

The North German lowland—although its hidden fundamental structures belong to the block country of Central Germany—must be regarded as a third independent division of Central Europe. Its surface was levelled by vast later deposits, and the influences of the great Glacial Period gave it a character of its own. The invasion of inland ice from Scandinavia helped to build up the diluvial ridges, and the waters into which this ice dissolved dug out the broad valleys through which the lesser rivers of to-day take a great part of their course.

Note on Authorities.—For general conceptions—such as the difference between Block mountains and Folded mountains—the English reader will do well to consult W. M. Davis's "Physical Geography."

Special information as to the physical development of Central Europe may be found, not only in Penck (*op. cit.*), but more particularly in M. Neumayr's "History of the Earth," second edition, edited by V. Uhlig, 1895.

The changes in the divisions of land and water are traced as closely as possible throughout all the epochs in *Lethæa Geognostica*, begun by F. Römer, in 1880, and now published by Fritz Frech.

All these works have been affected by the stimulating and guiding influence of Ed. Suess's *Das Antlitz der Erde* ("The Face of the Globe").

CHAPTER III

THE ALPS AND THE GERMAN DANUBE

An attempt was at one time made to explain the formation of mountains by the hypothesis of perpendicular upheavals along straight lines. Of all mountains the Alps can least be made to accord with such a theory. Their great curve taking every conceivable direction, first led to the recognition of the characteristics that mark a one-sided, folded mountain chain:—the movement from the inner side of the curve, the thrusting forward of the fold towards the outer edge, the encroachment of that edge upon the land beyond, the arresting power of old blocks of upland, and, on the other hand, the fracture of strata on the inner side, the formation of long lines of crevasse, and the drop of great areas of depression to form the plain of the Po.

But the Alps also taught us how great a part in developing the physiognomy of mountains is played by the destructive forces of the atmosphere. The action of the atmosphere, by carrying away great layers of Jurassic and Triassic limestones, and so denuding the highest mountain belt of its more recent covering formations, has imparted to the scenery of the Alps one of its most characteristic features, the exposure of a broad *Central Zone* of very ancient rocks—granite, gneiss, and crystalline schists. It may be calculated that at one time a mass of deposits more than 6000 feet thick arched over the mighty massifs of the central zone, and that but for denudation the Alps would rear their heads to a height of above 20,000 feet. At more than one point, in crossing the watershed of the Alps, we may still behold light grey caps of Triassic or Jurassic limestone crowning the highest points above us.

In the Grisons, indeed, we may cross from the Rhine to the Engadine, and from the Engadine into the neighbourhood of the Adda or the Adige, without ever setting foot on primitive rocks. This, however, is exceptional. In general the denudation has been so complete that the central zone of primitive formations stands out distinctly from the adjacent outer zones.

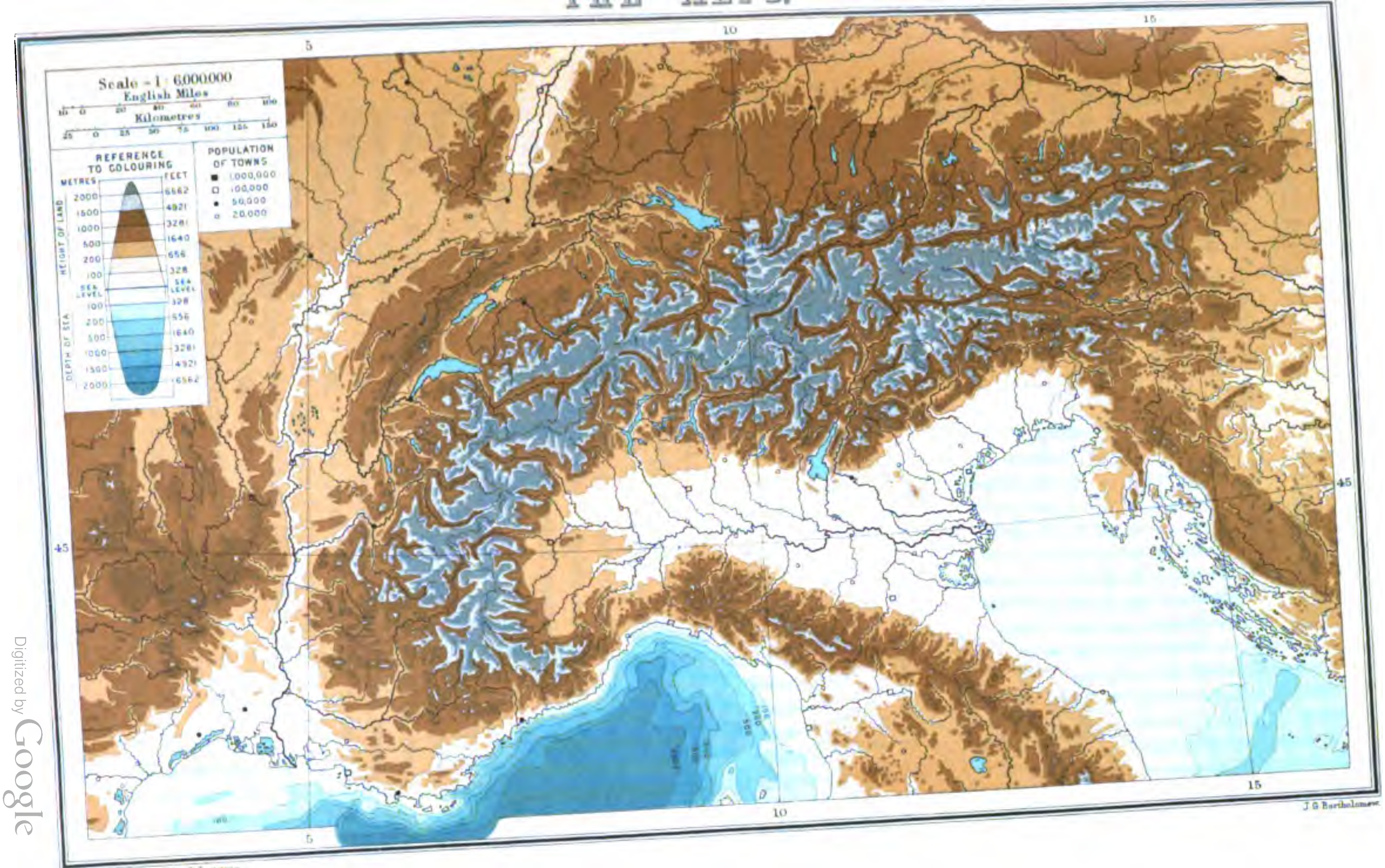
These outer mountains have been called the *Limestone Alps.* In the Eastern Alps the central zone of crystalline schists is sharply cut off by great longitudinal valleys from the proud walls of Triassic limestone, ranged in parallel order on the north and south. The especial charm of the Eastern Alps lies in the circumstance that, after first beholding the majesty and wild beauty of high mountains among the pale limestone barriers of the northern chain, we come next to the great longitudinal valley from Arlberg to Semmering, full of life, friendly habitations, and busy traffic, whence, rising by the transversal valleys of the central zone, we ascend into the world of glaciers that girdle the summits with frozen pendants and crown them with diadems of snow. Again, having descended from these heights towards the south, we pause amid the vineyards of warm valleys, sheltered from the north, before passing on between the massive limestone blocks and dolomitic ridges of the southern outer zone. So sharp a division between limestone rock and central zone as this which appears in the Eastern Alps does not occur again except in the French Alps, where the valleys of the Drac and of the middle Isère (Graisivaudan) present similar features in the partition of the mountains. In Savoy and Switzerland, on the other hand, the northern Limestone Alps are welded with the central zone. Not only do we find whole mountains of limestone set—like the Alps of Fribourg—upon a basis of central rock, but we also find, in the mountain sides west of the Aar, wedges of Jurassic limestone pushing their way like fingers amid the gneiss of the massif. At this point the geographical divisions of the mountains cannot claim to be supported by the boundaries of geological distribution.

The contrast between the central zone and the limestone mountains is not, however, the only feature of the longitudinal division of the Alps. A traveller who enters them from the Falls of the Rhine or from the Danube does not come immediately upon the limestone rocks. He finds their bare walls standing in a foreground of lower mountains (*pre-Alps*), rich in woods and pastures, built up from the detritus brought down from the Alps. Among them are schistose rocks, sandstones, and conglomerates, which the Swiss significantly call "nagelfluh" (nailrock), because innumerable rounded pebbles lie embedded in the cement of the rock like finger-nails in the flesh of fingers. The strata of this detritus, involved in the later upheaval of the mountains, have become steeply raised, and nothing can help us more clearly to realise the immense denudation which the Alps have undergone in the course of their existence than the exposed deposits of such mountains as the Rigi, the Speer, the Pfander, and the Wienerwald, built up of mere Alpine débris.

The destructive operations of water and ice continued of course even when the mighty disturbances of the earth's crust, by which the proud ranges of the Alps were created, had ceased. To them are due the valley formations of the mountains and the heaping up of the Alpine *foreland.* This last again is a geological formation of no simple kind. It includes deposits cast into the depths of a sea which once surrounded the Alps; others, of later date, formed in lakes; others, again—latest of all, and of all of most importance to the landscape—which have been brought down by Alpine glaciers of the Glacial Epoch, or spread by streams of melting water over a region which the glaciers either had not reached or had deserted.

If we divide the whole Alpine region thus—outermost zone or "Foreland" (*f*), Pre-Alps (*p*), Limestone Alps (*l*), Gneissic Alps (*g*)—we might expect, in crossing the mountains from side to side, to pass over seven successive belts (*f, p, l, g, l, p, f*). But even in the Eastern Alps there is

THE ALPS.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English Miles
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REFERENCE TO COLOURING
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J. G. Bartholomew

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scarcely a single section in which we should find all these belts developing themselves in this succession. In the Western Alps the southern outer zones are entirely absent, and the inner curving edge exhibits ancient schistose and gneissic rocks breaking off suddenly towards the Piedmontese area of depression. This conspicuous fact alone would form a sufficient ground for dividing the whole Alpine range into two wings, the dividing line of which follows the Rhine Valley from the Lake of Constance, rises with the Hinter Rhine to the Splügen Pass, and goes round the Lake of Como on its way to reach the Lake of Lugano and the Lago Maggiore.

The Western Alps are gathered together into narrower compass; their principal ridges press so closely upon the plains of Italy that the contrast between a steep inner and a more broadly developed outer slope becomes particularly striking; they include higher mountains, larger snowfields, glaciers more richly fed, and contrasts of altitude and climate both greater and more closely contiguous. The Eastern Alps are of wider extent; the river network of the Hungarian plain penetrates deeply into them, and divides their northern from their southern slope by broad longitudinal valleys, such as those of the Drave and Save; the mountains drop to more moderate heights and fade away by degrees, but the advantage of lower passes is lost in the continually recurring necessity for going up and down. On the other hand, the absence of great heights does not destroy the sublimity of the scenery. The variety of conformation is increased by blocks of Triassic limestone, whose size can nowhere be matched in the Western Alps, and by the predominance over wide areas of old volcanic deposits. The presence also of a series of strata lying horizontally, free from geological folding, and divided only by breaks, brings into the landscape an element foreign to the Western Alps.

But all these diversities between Western and Eastern Alps are but shades of variety in the character of that Alpine landscape which is common to both, and in virtue of which these naturally poor mountains exert so irresistible a charm upon all the cultivated peoples of Europe. The mere greatness of the unfolding pageant, the gigantic mountains, the extended prospect from their laboriously attained summits, give a sense of freedom to spirits habitually confined within narrower vistas. Greater pleasure, however, will be secured as we dig deeper into the existence of these mighty phenomena. The veils spread in lower and flatter lands by coverings of earth and vegetation are here lifted from the geological formation of the earth's surface. In rich variety, each with its own form and colour, the rocks stand out to do battle with the powers of the air. How various is their structure! Now great masses of rock lie without a trace of stratification; now the strata are plainly distinguishable, resting horizontally or steeply upheaved, or like yielding material, pushed into great waves, and creased elsewhere into tiny folds. Even the unprepared spectator cannot fail to receive some notion of the mighty forces which have shaped this world of mountains. One part of these forces indeed he still beholds working actively, not only in great convulsions, as when the earth quakes along the fracture lines of the Alpine valleys, or along that of the chain's edge at Belluno, Laibach, or Agram, but day by day in the silence of lonely valleys may be heard the sliding down of fragments worn away from the rock by the action of the weather, the rushing of brooks that are cutting the ravines deeper, and the thunder of avalanches that come sweeping down some mountain side. When heavy rains fall on the slopes the torrents fill and swell into overwhelming strength. Those who have never seen the rubbish heap brought down by an Alpine torrent have no conception of the carrying power to which running water may attain, especially when, loaded with fragments torn from its bed, it flings itself onward in a stream of slush. Nature, then, seems to be trying to create something half-way between a river and a glacier.

The glaciers, those imperceptibly moving rivers of ice that travel down majestically from large ice-fields, passing between forests and coming into the neighbourhood of human habitations, are doing their part in the geological work still proceeding in the Alps. The spectacle of one of these great glaciers seems to threaten that the ice will push its way, conquering and destroying, into the domain of life and cultivation. When, however, we consider the Alps from a wider horizon of time, we become aware that exactly the reverse has taken place. The extent of perennial snow- and ice-fields actually existing in the Alps is 1400 square miles, and the area of the glaciers of the

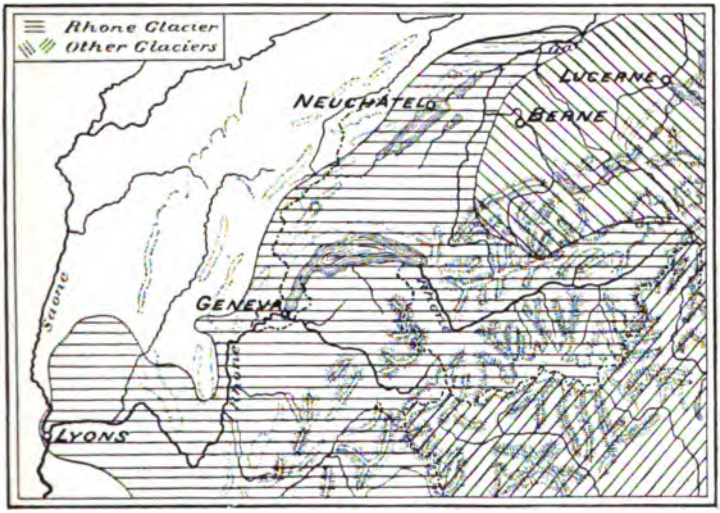


FIG. 4.—The Rhone Glacier in the Ice Age. (After Falsan et Chantre.)

Bernese Oberland—the largest connected expanse of the present day—is 180 square miles, but the diluvian Alpine glacier system occupied more than 65,000 square miles. How modest appears the Aletsch Glacier, with its fifteen miles of length and its superficies of forty-five square miles, in comparison with the Rhone Glacier of the Glacial Period (9270 square miles) which passed—2600 feet thick—through the narrow valley of St. Maurice, and spread its high front from Lyons to Vienne. This picture from the Glacial Period gives us a new standard by which to measure the present; the woodlands clothing the mountain sides, and the many-coloured blossoms of the meadows, pushing their way to the very edge of the snow-fields, seem a triumphal procession of life.

The snow-fields themselves, in their present restricted dimensions, are not only a boundary of life, but also a storehouse whence life draws nourishment and strength. In them is concentrated that value which high mountain lands possess for whole countries as collectors of atmospheric moisture. As the air travels up the mountains, expanding and growing cooler on its way, the moisture contained in it becomes partially condensed, by the lower temperature, into clouds and showers. While the annual rainfall of North Germany is about 24 inches, and that of South Germany about 32, along the north of the Alps it rises to from 40 to 48 inches, and at exposed spots in their interior to as high as 80. The maximum of 100 inches and over occurs not in the Western Alps, but at the inner angle of the Adriatic Sea, in the valley of the Tagliamento and in the mountains of Carniola. A remarkable contrast to the abundance of rain in the higher mountains is afforded by valleys that lie sheltered under the lee of high ridges. Dry sunny stretches of this kind—islands, as it were, in the Alpine ocean of rain—are the upper valley of the Durance, Valais, the Engadine, and the upper valley of the Inn. Places may be found in these valleys with an annual rainfall of 26, and even of 24 inches. As the summer temperature of these enclosed longitudinal valleys is apt to be particularly high, the climatic conditions are usually favourable, and the limit of growth for trees and all cultivated plants is higher in them than elsewhere.

Soil as well as climate has an important part in fixing the limits of the belts of plant life which succeed one another below the snowline. The limestone cliffs on which the edelweiss flourishes are less favourable to other species than the deep mould formed by the decay of schistose rocks. When all is said, however, temperature remains the chief factor in determining the distribution of vegetation. The scale of temperature is lower on the northern than on the southern slope of the Alps, and the contrast between the two slopes, the impression received in passing from the highlands of Bavaria to the Lombard border of the Alps, is thus intensified. The northern border of the Alps, from the Lake of Constance to the basin of Vienna, lacks the vine. From the Lake of Geneva only, whose reflected warmth swells the grapes of Vaud into sweet juiciness and lends fiery strength to their wine, does the culture of the grape push its way far up into one valley of the northern slope, into sunny Valais. Along the Rhine the vineyards end at Chur. At the eastern base of the mountains the vine ventures only to moderate heights—barely 1300 feet—in the valleys of the Mur, the Drave, and the Save. The whole southern border of the Alps, on the other hand, is one delightful vineyard, the outposts of which extend up the valleys to an altitude of 2600 feet. The two ends of the Alpine curve, indeed, touch the region of genuine

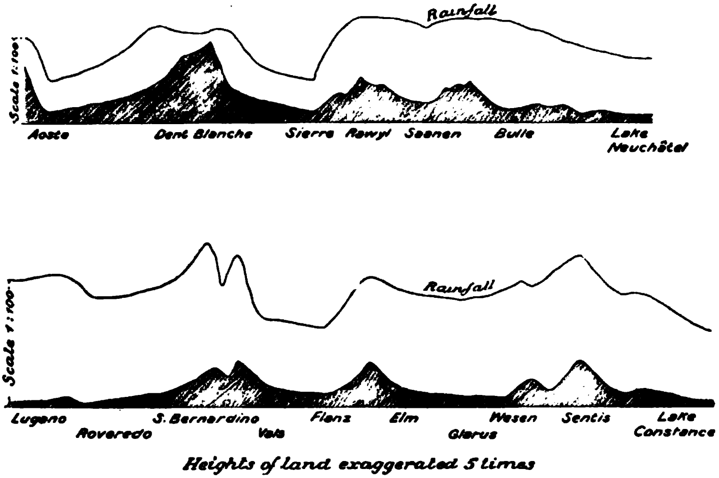


FIG. 5.—Comparative Heights of the Land and Amount of Rainfall.

Mediterranean vegetation. The olive fills the hollows below Tenda, from Saorgio, and also the plain of Goritz on the farthest Polar limit of its distribution. From the plain of the Po it is excluded by cold winters; but a few sheltered nooks of the Lombard lakes afford a home to it, and to more delicate plants still, belonging properly to an evergreen sub-tropical flora. An extreme instance of the favourable climate enjoyed by Alpine valleys open to the south is presented by Meran, eighty miles within the Alpine border. This valley surrounds the castle of Tyrol as if with the garden of the Hesperides, and delights the Northerner whom delicate health drives hither in winter, by offering him the beauties of a far more southern landscape. A glorious adornment of the southern valleys of the Alps, as well as a treasure for their inhabitants, is furnished by the chestnut groves, whose leafy domes come to perfection on many a slope above the level of the vine. It is true that the chestnut attains a fine growth in the milder northern valleys as well as by the Lake of Lucerne, but to see it in its full glory, as lord of the landscape, we must seek it on the Italian slope of the Alps, and especially in the valley nooks of Piedmont.

While the crop principally cultivated among the vines, chestnuts, mulberries, almonds, and figs of the southern Alpine valleys is maize, cornfields run up from the north—in high valleys to a considerable altitude—between green woods and pine forests. The more remote and inaccessible any district, the higher does cultivation need to push its bold aspirations; therefore the level of cultivation, and with it the level of permanent human habitations, is exceedingly variable, ranging in the Eastern Alps from 3600 to 5900 feet above the sea. In regard to the possibilities of agriculture in high mountains, it is a remarkable fact that oats and barley are being tried on the top of the Brenner (4470 feet high), where potatoes, cabbages, and turnips thrive without difficulty. The highest wheat-fields lie a little lower, on the sunny southern slope. Rye and oats will ripen, even on the summit of Mont Genèvre (6100 feet high).

If, in the matter of cereal cultivation, the mountaineers often achieve the apparently impossible, the same praise cannot be given them as regards their forestry. The uppermost line of trees, occupied sometimes by the pine (*pinus picea*), sometimes by the arolla (*pinus cembra*), and sometimes by the larch, has in most places been lowered, either by reckless using up of the timber or by its actual destruction to make way for pasture-land. The authorities recognise the importance of forests, both in helping to maintain the soil and in forming a protection against the ravages of torrents, and are making efforts to preserve the existing woods and to replant, at immense trouble, where they have been destroyed, but their efforts are only succeeding slowly. The most shocking instance of destruction is to be seen in the lacerated slopes of the Basses Alpes, but Ticino, Southern Tyrol, and the Venetian Alps have also in many places been sadly maltreated. In Northern Switzerland 4430 feet is considered to be the average limit of the beech tree, and that of conifers 6900; but among the Rhætian Alps, the larch and *pinus cembra* sometimes reach considerably higher—to as much as 7900 feet.

In other parts of the Alps so great a height is scarcely attained by the dwarf forms of Scotch fir and juniper, which, together with rhododendrons, make up the brushwood of the Alpine region. In summer time the succulent herbage affords pasture to herds of cattle, which begin to come up in the spring, ascend step by step, and only return at Michaelmas to their stalls in the villages. A few permanently inhabited dwellings, mountain hotels, and hospices of the main Alpine highways are exceptions from the usual nomadic conditions, and stand on the heights near to the snow-line, while far higher still rise the observatories of meteorological science. No other mountains number so many of these as the Alps. The highest are on Mont Mounier in the Alpes Maritimes, the Great St. Bernard, the Sentis, the Zugspitze in Bavaria, the Sonnblick in the Tauern, and the Hoch Obir in Carinthia. Even on the summit of Mont Blanc self-registering instruments are at work. Thus high does modern science push its outposts, and not content with the triumphs wrung already, and being wrung every year from investigation of the mountains themselves, is now lying in wait that it may overhear the laws of the winds.

The spectacle of the Western Alps as seen from the plain of Piedmont is very imposing, because great heights, such as the black pyramid of Monte Viso, the broad, glacier-covered summit of the Gran Paradiso, and the icy wall of Monte Rosa, lie quite close to the outer edge of the mountains. These are the dominating heights in the three groups of the Cottian, the Graian, and the Pennine Alps, which together form the inner zone of primitive central massifs. An outer concentric circle, divided from them by valleys and passes, is formed on their south, west, and north sides by the following groups: the Maritime Alps, dark and besprinkled with tiny lakelets and diminutive glaciers; the masses of Oisans, rising, rugged and forbidding, from deep valleys, between whose summits are sliding down glaciers of the first magnitude; the Belle Donne heights adorning the horizon of Grenoble; the mass of Mont Blanc; and the Bernese Alps.

The line of longitudinal valleys, running from the neighbourhood of Gap, along the Drac and Isère, by Grenoble to Albertville, divides the domain of the central masses from that of the Limestone Alps, ranged beyond.

These limestone mountains separate at Chambéry; only one of the branches joins the Alps. A western branch continues in due northerly direction, and dropping gradually to more moderate heights, forms the Jura chain, whose half circle, steep on the inner side from Chambéry to Schaffhausen, surrounds the outer Alpine zone of Savoy and Switzerland.

North of Chambéry the Alpine system thus becomes not only broader, but more varied in its kinds of soil and more important to social and political life. The tableland of Switzerland interposes its independent productive domain between the rugged, highest mountains and the gentler forms of the Jura, whose blue belt, long drawn out and varying but little in elevation, stretches along the north-western horizon. Behind the foremost ridge numerous others rise in parallel order, divided by high valleys and getting lower and lower, flatter and flatter, until the last waves of the swelling Jura die out on the Jura plateau of France. The heights are moderate, but the number of ridges is a hindrance to traffic, hardly mitigated by the occurrence here and there of "cluses," narrow gorges which cut across particular mountains and allow the rivers to pass from one longitudinal valley to another. The Doubs is the most striking example of a Jura stream winding to and fro in this network of valleys. The limestone of the mountains, with its clefts and holes, also affords subterranean passages to the rivers. The water from basins without any apparent outlet accumulates in caves, and afterwards comes to light again with the vigorous flow of real rivers. Thus the source of the Orbe proves to be the outflow of the Lac du Joux. Many shallow lakes have been converted into peat bogs, and now form melancholy moorlands enclosed by gloomy woods. The severity of the snowy winters, the poverty of the soil, and the contour of the thinly populated mountains, combine to form an effectual barrier. There are only a few valleys to which modern industry, supplemented by water-power, imparts a more active life.

In order to realise vividly the change of character undergone by the mountains along the line of their direction, we shall do well to consider how differently the Rhone and the Rhine find egress. The way of the Rhone is barred by Mont Credo. The ravine cut by the stream through the innermost rampart of the Jura is too narrow to carry the railway, so that a tunnel 13,000 feet long has had to be bored through the mountain. No less than six chains of the Jura have to be passed on the way to the plain, and the branching and winding valley whereby the Rhone achieves this passage is forty miles long. But the Rhine finds no chain of the Jura at all before it; the last fold of these mountains that attains any considerable height ends beyond the Limmat, not far from the hot springs of Baden. All that the Rhine has to do is to pass through the tableland of the Jura, in which task it succeeds above the mouth of the Aar. The falls of the Rhine, however, are not here, but far to the east, where the river begins to accompany the southern border of the Jura. The occurrence of the famous falls is a sheer accident. The Rhine at one time filled up its bed with gravels, and, flowing over their surface, diverged so far to the right of its original course as to approach very closely to the edge of the Jura. By-and-by, when it again began to deepen its bed, it came down not upon its old hollowed channel, but upon the projecting spurs of the Jura, which its fall is now in process of eating through. The Jura, in all circumstances, and throughout its whole extent, is a clear natural boundary, but the Federation has not everywhere respected it.

The core of Switzerland's political strength is to be found in the outer circle of the Helvetian Alps, enclosing and uniting the sharply divided Alpine valleys that lie between the Rhone and the Rhine, and clearly divided in turn by the great lakes of those two rivers, from the kindred territories of Savoy and Swabia. When the sea which once filled this expanse had retired, the direction of the oldest watercourses was given by the north-westward slope. The broad valleys washed out by these streams converted the plateau of sandstone and conglomerates into a mountain tract, whose outline early became irregular. The connection between various parts of the ancient valley system has been reconstructed by geologists from the separated elements. One old course of the Rhine is indicated by the succession of valleys from Sargans by the lakes of Wallenstadt and Zürich to the Limmat. An old middle course of the Reuss passes from Brunnen, where the delta of the Muotta interrupted it, past Schwyz to the lakes of Lowerz and Zug. Towards the same basin, too, goes the valley whose upper part is crossed by the Brünig railway, and whose lower part is filled by the transverse arms of the Lake of Lucerne. The lakes of Baldegg and Hallwyl, too, as well as that of Sempach, lie in the bed of similar valleys. The closing of these valleys and the transformation of some of their parts into lakes are due in part to subsequent structural disturbances, in part to later deposits and more especially to the influences of the Glacial Periods. There was a time when the Alpine valley glaciers covered the whole land up to the Jura without a break: when they afterwards divided and began to retreat, they left behind, not merely occasional erratic blocks, but whole ridges of immense moraines and broad strata of rubble. It is amazing to see how freshly preserved—like the skin from which a snake has just slipped out—are the amphitheatres of moraine left by the Rhone glacier at Wangen on the

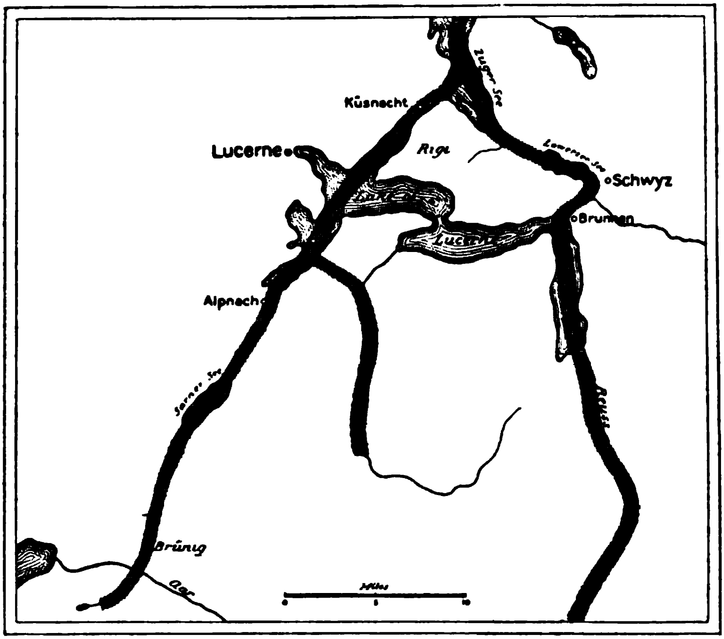

Zuger See
Küsnacht
Lucerne
Rigi
Lowerzer See
Schwyz
Brunnen
Lucerne
Alpnach
Sarner See
Reuss
Brünig
Aar
Miles
0
5
10

FIG. 6.—Ancient Valleys of the Four Forest Cantons. (After Albert Heim.)

Aar, and by the Reuss glacier at Mellingen. The terraces, by which many of the more deeply cut modern rivers are bordered, are also made of boulders and pebbles brought down by old glacier streams. Sometimes there will be several such terraces, one above another: at Schaffhausen there are as many as five. These are due either to several glacial periods, or to the repeated advance, during the same period, of a glacier, always travelling down a furrow of erosion cut through still older glacial formations.

The whole landscape of the Swiss highlands thus bears upon its face the marks of the Glacial Period. To that period the country owes its greatest beauty—the abundance of lakes. No doubt it is true that basins as large as that of the Lake of Geneva (223 square miles in extent and 1014 feet in depth) and that of the Lake of Constance (208 miles in extent and 827 feet in depth), or as complex in form as that of the Lake of Lucerne, must have been formed by some structural causes. Swiss geologists hold the opinion—which has been thought to be clearly established by the case of the Lake of Zürich—that, at some time previous to the Glacial Period, a sinking of the Alps, and consequently a relative rising of the outer circle, occurred, which reversed the gradient of the valley openings, and, by damming up the waters, submerged part of the valleys and formed the outer lakes of the Alps. Even if this were the case, the continuance of the lakes must have been promoted by their being filled with ice from the glaciers; in some instances, too, a wall of moraine, forming itself around the ice promontory of a basin, must have given to the regenerated lake a higher level and a greater expanse. Masses of boulders from the Aar divided the lake of Biel from that of Neuenburg, while the lake of the Aar district was cut in two by the delta of Interlaken.

Viewed from the outer summits of the Alps, these numerous lakes afford a delightful prospect; that from the Rigi, in particular, is incomparable. The lakes, moreover, are active foci of life. They were so even for the poor pile-dwellers who concealed their huts amid the arms of the waters. They are so, no less, for the world of modern culture. The Lake of Lucerne, shutting off the upper valley of the Reuss, was the cradle of Swiss freedom. The light of the lakes shines upon the finest vineyards and orchards of Switzerland; in their mirror are reflected the leading towns, socially and intellectually, of this happy country, whose natural gifts have developed under the blessing of a long peace. The land is full of verdure and freshness, of busy streams, rich meadows, trim little towns, cheerful villages, and scattered country-houses, gazing proudly into the ramparts of the Alps. Every glance cast up at them strengthens the assurance: "God has built us a castle of freedom."

In the inmost heart of the high mountains, three great rivers, flowing through the three largest outer lakes, the Rhone, the Reuss, and the Rhine, almost meet at their fountains. The transversal valleys of all three, which are filled with new land, formed at the head of the lakes by the rivers themselves, rise gently at first, then close in, and become gorges, those of the Rhine being gay and pleasant, those of the Rhone dark and gloomy, and those of the Reuss wild and impressive. All these transversal openings end in that chain of longitudinal valleys, which together form the main central road into the fastnesses of the Swiss mountains. The bend of the Rhone at Martigny, and that of the Rhine at Chur, are 130 miles apart. Seventy-five of these miles lie in Valais, up to the Rhone glacier; forty in the Bundenerthal of the Hither Rhine; and fifteen in the Urserenthal, where the Reuss rises. This river collects its springs on the green plain of Andermatt before it rushes, foaming in wild waterfalls, through the terrible ravine of the Schollenen, into its transversal valley. The unity of the great inner line of valleys is of importance to the coherence of Switzerland, and facilitates communication between the cantons.

North of the Valais the peaks of the Bernese Oberland, carrying the richest glacier field of the Alps, rise majestically above their neighbours. How differently, however, would they stand out if the thick deposit of limestone distinguishable in the valleys and on the outer hill tops around had remained on their summits.

If we stand on the threshold of Valais, between the proud entrance columns of the Dent du Midi and the Dent de Morcles, an inspection of their foundations will readily convince us that at this point the rocks of the Mont Blanc group extend across the Rhone, and dipping under the Alps of Fribourg, form a bridge of connection with those of the Bernese district. In length and breadth as well as in complexity of parts the Mont Blanc group falls below the Bernese Oberland, but the spectacle of Europe's highest peak (15,781 feet high) and the glaciers belonging to it is so striking that the lover of the Alps cannot be contented with a mere visit to the valley of Chamouni, but must make the circuit of the whole group,—"Le tour du Mont Blanc." This circuit is much easier than the corresponding circuit of Monte Rosa, since that highest point on the Pennine Alps, while rising from valleys equally deep, is situated among much higher ridges: the eastern descent towards Macugnaga is perhaps the most beautiful close of a valley to be found in Europe. The steep fall, on the south, into the Val d'Aosta, and the connected sheet of glaciers on the north, render the Pennine chain and the Mont Blanc group the most inaccessible portions of the Alps. Even the Great St. Bernard, upon whose crest antiquities have been found, proving it to have been much travelled in early times, is still without a carriage-way. One of the largest stretches without a carriage road in the whole Alps, lies between the Little St. Bernard and the Simplon—a distance of eighty miles. The Simplon is the first of a series of passes—the St. Gotthard, the Lukmanier, and the San Bernardino—which lead from the valley of the Rhone, the Reuss, and the Vorder and Hinter Rhines, into the four most important divisions of the Upper Ticino district. This whole sheaf of roads, as well as the railway which already passes under the St. Gotthard and that which will shortly pass under the Simplon, converges upon Milan. The fact that so many roads here lie so near together, bears witness to the comparative lowness of these mountains near the end of the Western Alps. Only the Adula group, at the source of the Hinter Rhine, can show any considerable glaciers. Immediately to the east lie the San Bernardino and the Splügen, important links between the valley of the Hinter Rhine and the two great Lombard Lakes. Between these two passes we may hesitate, when we are setting the boundary between the Western and the Eastern Alps.

At the present time Chur appears the natural centre of the complex system of Rhine valleys, but this was not always the case (Fig. 7). Traces can still be distinguished of an earlier condition of the country's surface, by which the centre was thrown more to the north, in the direction of Ragatz. In the Tertiary Period, when the planes of the valleys were some 1600 to 2000 feet higher, the abandoned high valley of the Heath of Lenz, between Chur and Tiefenkasten, formed the middle section in the main trunk of this valley system. The line of transversal valleys between Chur and the Lake of Constance was thus continued southward to the source of the Oberhalbstein Rhine at the Septimer Pass. At that period the Hinter Rhine did not end at Reichenau, but flowed northward on a higher valley plane to the Kunkels Pass, and, following a valley which has now been succeeded by that of the lesser Tamina, did not join the main river till Ragatz. At Pfeffers its stream cut a deep and narrow gorge in the wide expanse of the old valley. Thus the erosion of two streams working backward from Chur and Thusis cut out the two longitudinal valleys of the Rhine and of the Albula at Schyn Pass, and tapped the old transverse valleys at Reichenau and Tiefenkasten. The dry beds of these streams, at the Heath of Lenz and at the Kunkels Pass, are broad and lie high; they offer a striking contrast with the later narrow gorge into whose shadows the admiring traveller gazes down from the Via Mala or the Schyn Pass. Clear examples of the conflict for the drainage are also furnished by other streams in this district. The Landquart, intervening from behind, robs the Davos Landwater of its sources of supply at Klosters. The swift Mera, too, forces backwards its invading way through the slowly retreating cliff of the Maloggia Pass towards the Engadine, on whose flat surface the Inn is dammed up into lakes by rubbish-heaps from side streams. The farthest springs of the Mera were at one time sources of the Inn.

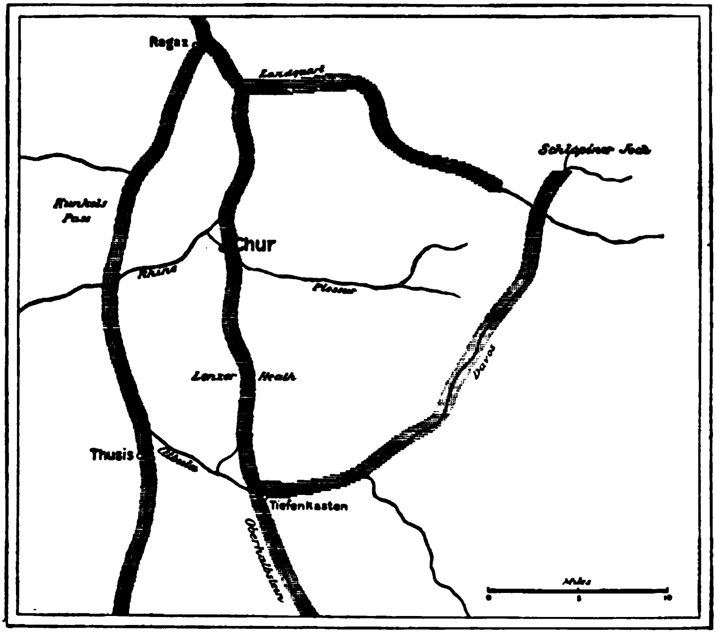

Ragaz
Landquart
Schlappiner Joch
Kunkels Pass
Chur
Rhine
Plessur
Davos
Lenzer Heath
Thusis
Albula
Tiefenkasten
Oberhalbstein
Miles
0
5
10

FIG. 7.—Ancient Valleys of the Grisons. (After Albert Heim.)

At the sources of the Inn we come to the basin of the Danube, by whose extensive longitudinal valleys and eastward flowing waters the greater part of the Eastern Alps is dominated. The Engadine, fifty miles long, which forms the Swiss portion of the Inn valley, lies on the surface of the Rhætian Alps, the most massive part of the central zone, and the only part in which the valleys occupy levels considerably above the sea. The valley plane of Pontresina, the spot in the Upper Engadine most frequented by tourists, lies as high as the top of the Rigi. An easy walk brings the traveller to the Languard, a peak better situated than any other to afford a view of the Rhætian Alps in their entirety. Immediately opposite towers the icy Bernina group (13,297 feet high); on the north, across the Inn, lies the North Rhætian ridge, deeply indented by passes; on the south-east, the snow peaks of the Ortler (12,802 feet high) and of the Adamello, jutting far out towards the plain of the Po, shine from the other side of the Valteline. Thus we recognise unmistakably the way in which the Rhætian Alps are divided into three by the valleys of the Inn and of the Upper Adda, whence the highest carriage-road of the Alps passes over the Stelvio into the Adige district.

The tendency of the central zone to divide into massive mountain blocks united by a high foundation is conspicuous in this district, and is strikingly repeated on the other side of the eastern Swiss frontier by the broad, high-lying valley of the Reschen Scheideck. On its flat surface it collects the sources of the Adige, and sends out a brook on the other side to join the Inn at the gorge of Finstermunz. The drop of this broad saddle (4901 feet high), and the still deeper cut of the Brenner Pass (4495 feet high), isolate the group of the Oetzthal Alps to quite an exceptional degree. Valleys running northward open up their interior as far as the main ridge, clothed with glaciers, which drops sharply to the south.

The importance of the Brenner is increased by its being the last carriage-way over the Alps for more than a hundred miles. The chain of the Hohen Tauern stretches through that distance, and joins together the last great glacier fields of the Alps in the groups of the Zillerthal, the Venediger, and the Gross-Glockner. The sharp ridge of the Gross-Glockner (12,461 feet high) looks down upon one of the most beautiful glaciers of the continent. The last snow-peaks surround the angle of the Mur, and are succeeded by the bifurcation of the central zone into chains of rapidly diminishing height.

The mountain masses of the central zone include almost all the glaciers of the Eastern Alps,—a total expanse of not less than 674 square miles; their peaks throughout overtop those in the outer zones by 1300 to 2600 feet. And yet it is these outer zones that must be visited if we would find landscapes that the western Alps cannot equal. The abundant lakes of the western Alps are all upon the north-western border. The openings of Alpine valleys in Piedmont exhibit no great sheets of water, but only small pools lying in the moraine amphitheatres of the two Doras. How greatly is this landscape surpassed by that of the Lombard lake districts between Ticino and Mincio! The deep basins, whose beds lie far lower than the level of the sea, have often been compared with the fiords of the north. Like those, they were once full of ice. Their southern ends are surrounded by moraines which form wide stretches of hill country. Ice it was which brought down from the Tyrolese mountains those blocks of which the heights south of the Lake of Garda are built; those heights on which the battle of Solferino decided the fate of Lombardy. But how wide is the difference between the gloomy landscape of Norwegian mountain shores and the lake strands of Lombardy, whose rocky nooks are filled with the silver grey of the olive, and even with the shining foliage and golden fruits of oranges, citrons, and lemons.

The mountains among which these Italian lakes lie beneath the smile of heaven are the beginning of the southern limestone Alps. Even here, however, a certain intermixture of volcanic rocks is to be found. Across this varied geological map the Lake of Lugano stretches its arms indifferently, running with equal disregard through hard rocks and soft. Here the mountains are broken up by a complex system of valleys, but between the plain and the vine-growing valley of the Valteline they re-unite and form the mighty chain of the Alps of Bergamo.

As it runs round the southern base of the Adamello group, the ridge of limestone mountains grows narrower; but it spreads into breadth and into fine outlines at the wide bay of the Adige inside the obtuse angle that would be formed by lines drawn from Brescia to Meran and thence to Toblach. At their northern end, however, near Bozen, the limestone and dolomite mountains rest upon the high platform of a porphyry bed which is 1700 to 2300 feet thick, and has an area of more than 600 square miles. Upon the undulating surface of this abundantly wooded plateau, deeply cut by the narrow gorges of the tributaries of the Adige, may be found the most varied formations lying quite close together; softly shaped lumps of volcanic tufa, overgrown with a carpet of swelling turf, lie side by side with abrupt dolomite cliffs, the work of coral animals in the Triassic sea. A belt of limestone and dolomite rocks of similar origin runs, like the ring of steep coral rocks round Australian islands, along the south as well as the north of the Tauern. Along the horizon of Bozen the multiform variety of these dolomite rocks may be seen in the mighty flat-topped stump of the Schlern and the teeth and needles of the Rosengarten. These reefs have generally no trace of stratification; and where stratified rocks rest upon them they lie unbroken and horizontal. This circumstance deepens the surprising impression produced by these mountain blocks, which are devoid of folds and broken only by lines of fracture and displacement. The silver diadem of a glacïer marks the Vedretta Marmolata (11,024 feet high) as the queen of the district.

The whole varied mountain world of South Tyrol, with its convergent valleys, is seamed through the centre by the broad way of the Adige, closed above Verona by gorges. "Strada d'Allemagna" led from Venice along the Piave, and this road, which travelled between rocks rising high towards heaven, found an easy way out by the valley of Ampezzo. It emerges on the field of Toblach (3967 feet high), lying in the midst of the Pusterthal, on the Pontic and Adriatic watershed, whence the

Rienz flows westward to the Eisack and the Adige, while the Drave flows eastward. Both these rivers water the great longitudinal valley that forms the boundary between the central zone and the southern limestone Alps, serving as a connecting road along the south between the Austrian Alpine districts.

The course of the Drave valley opens to the Klagenfurt basin, which is the heart of Carinthia. In summer the clear waters of the Lake of Wŏrth, untouched by the turbid glacier streams of the neighbouring Drave, attract visitors from many parts to bathe in them or to sail upon them. In the winter, however, a crust of ice covers the face of the waters ; for in that season a lake of cold air, colder than that of the mountain slopes above, fills the valley basin of Klagenfurt, and turns it into a little Siberia amid the Eastern Alps.

The Carinthian basin is accessible for traffic, for it is crossed by the railway from Vienna to Venice, whose rails obtain easy access to the valley of the Tagliamento by the Pass of Pontebba. The limestone mountains overshadowing this pass are dominated by the Triglav, the proud south-eastern final pillar of the Alps. The rough tablelands extending from its foot already distinctly exhibit the characteristics of the Karst, in their moderate height, their caverns, and their hidden water-courses. Thus the closed basin of Laibach, in the centre of Carniola—not less than the bays of Karlstadt and Graz opening widely towards the Hungarian plain—lies on the very limit of the Alps.

The easternmost of the Alpine railways, the line Trieste to Vienna, touches Laibach and Graz without encountering any serious difficulty before the Semmering Pass on the height leading over to the plain of Lower Austria. This pass is important also because it marks the eastern end of that great chain of valleys which forms to the geologist's eye the approximate, but to the geographer's the perfectly clear and connected boundary between the Central Alps and the northern secondary zone of the Eastern Alps.

The Inn, Salzach, and Enns rivers, which are the principal elements in this long succession of valleys, have each an upper reach, running longitudinally with the chain, and a lower reach carrying them crosswise through the Limestone Alps to the plain. The transverse valleys (Figs. 8, 9), which are older than the longitudinal reaches, divide the Northern Alps into sharply isolated groups, which to the west form sharp ridges and slender pointed peaks, as do the Wetterstein Mountains, which include the Zugspitze, the highest peak in the German Empire. It is only in Salzburg and Upper Austria that mountain blocks prevail with a broader ground plan and with flatter tops ; their surface, however, is rendered almost impassable by the unevenness of the "Karren"—irregularly shaped holes and channels which owe their existence to the unequal decomposition of the limestone by the action of stand-

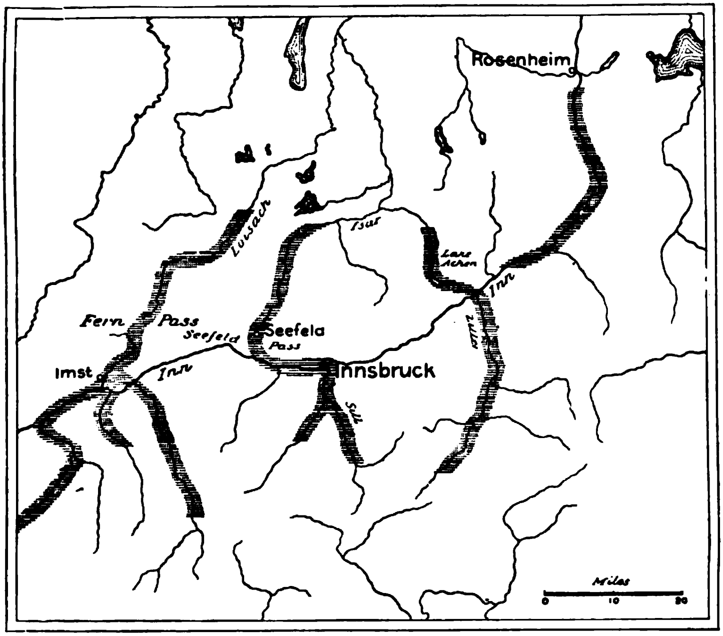

Rosenheim
Loisach
Isar
Lake Achen
Inn
Fern Pass
Seefeld
Seefela Pass
Imst
Inn
Innsbruck
Sill
Ziller
Miles
0
10
20

FIG. 8.—Ancient Transverse Valleys of the Northern Alps.

ing or running water. The ground looks as if sulphuric acid had rained upon it. Not without reason does one of these blocks bear the name of the Dead Mountain. Amid their wild limestone formations the Northern Alps have no lack of rich meadow lands. There are extensive woods, too, both in the mountains and more particularly on the belt of sandstone and schist which forms their external border. This belt is particularly broad in Austria, but is seldom so completely wanting as to permit the proud limestone mountains to come close down to the foreland.

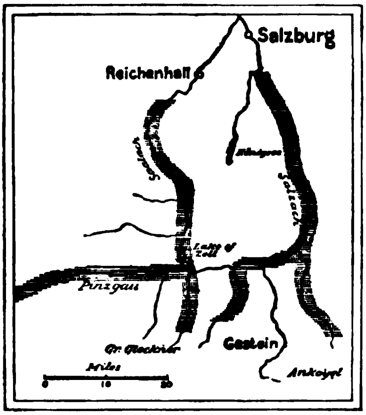


FIG. 9.—The Conquest of the Pinzgau by the Salzach.

A great charm is imparted to the scenery by the lakes, which, like the Königsee and the lake of Hallstatt, below the Watzmann and the Dachstein, may be formed by closed basins penetrating between steep mountains; or, like the Plansee and Achensee, fill up a stretch of valley closed in by heaps of débris; or, after the fashion of the Walchensee, look up out of a deeply eroded basin between wooded heights, like a dark eye beneath bushy eyebrows. The larger number are gathered together in the Traun district of Upper Austria. It is here, in the Salzkammergut, that the Schafberg, the Austrian Rigi, stands surrounded by lakes, some of which—like the outer lakes of Switzerland—fill the outlets of the valleys and belong half to the mountains and half to the foreland.

The glacial epoch which down to these basins filled the valleys with mighty ice-streams, left also far outside on the Bavarian foreland some beds of lakes hollowed by the erosive power of great glaciers. The lake of Starn-

THE ALPINE FORELAND AND THE GERMAN DANUBE.

berg was originally the middle one of three sister lakes. The Isar began by eating through the bank of the eastern lake—the basin of Wolfratshausen—then emptied it by flowing through it. . The western lake, however, the Ammersee, still remains and marks the last point of advance of a diluvial glacier.

The largest glacier received by the Alpine foreland came, of course, from the Rhine valley. The most advanced moraines reach to the Upper Danube. The source of the Danube lay, at that time, within the icy portals of the Rhine glacier. It was only the moraines left behind after its withdrawal which formed the watershed between the Rhine and the Danube.

While the moraines of the Rhine glacier come into immediate contact with the Swabian Jura, and while the deposits of the glaciers themselves and of those of their melting waters are mingled upon the same ground, the high plain of Bavaria along the Isar is divided more clearly into zones, and offers three distinct types of landscape. The most southerly, extending from the foot of the Alps to beyond the lakes, is the hill country of the moraines, with little pools and dried basins of peat. Next, on the north, and sloping slightly northward, comes the tract of gravels which, brought down by the melting glacier waters, and finding no distinct limit, were spread out widely and scattered over the plain. This bed of gravels is extremely pervious to the water, which percolating through the whole stratum, runs away in a hidden sheet underground. The surface is poor in water and unfruitful, but mostly covered with woods. Only in valleys that penetrate lower, and on the northern border of the bed where it grows thin before disappearing, does the water come near to the surface, which it turns into a swamp. It is in this way that the great bogs of Dachau and Erding, which must not be mistaken for silted-up lakes, have been formed. In the midst of this poor and thinly-peopled rubble field, between its wooded south and its marshy north, stands Munich. Still farther to the north the substratum of old hill land merges, and forms a third zone reaching to the Danube, strongly moulded by waters, and presenting a fertile, well-cultivated landscape. On the meridian of Ratisbon, where the Alpine foreland reaches its maximum breadth of ninety miles, this division is most clearly distinguishable. It prevails also in the Austrian foreland. There, however, the hill country obtains a greater width in the Hausruck. The moraine land, on the contrary, shrinks more and more. Even at the Enns it draws back into the interior of the Alpine valley. At Melk, where the Danube enters the granites of the Bohemian group, its southern bank is divided from the edge of the Alps by a strip of gravels only twelve kilometres wide.

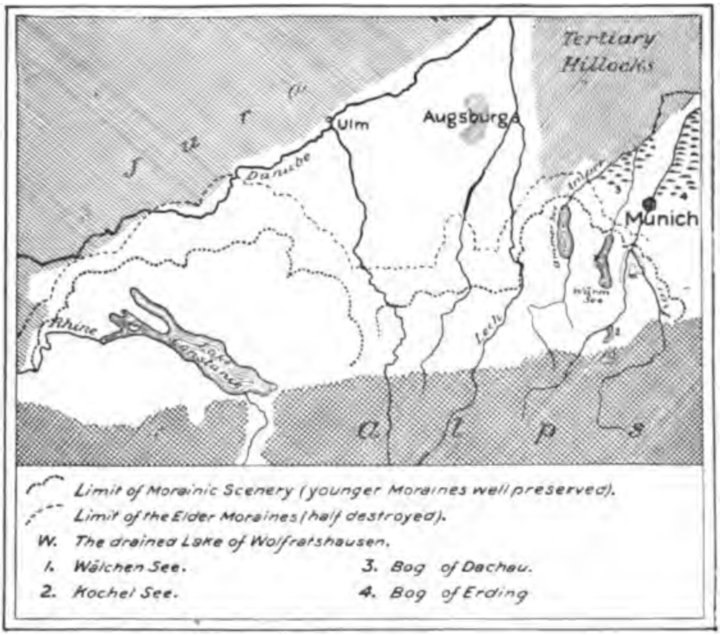

Tertiary Hillocks
J u r a
Ulm
Augsburg
Danube
Munich
Rhine
Lake Constance
Lech
Würm See
3
4
1
2
a l p s
Limit of Morainic Scenery (younger Moraines well preserved).
Limit of the Elder Moraines (half destroyed).
W. The drained Lake of Wolfratshausen.
1. Wälchen See.
2. Kochel See.
3. Bog of Dachau.
4. Bog of Erding

FIG. 10.—Lakes and Moraines of the German Foreland of the Alps.

The division of the Alpine foreland into provinces has naturally been founded, not upon the longitudinal zones of geological formation, but upon the transverse course of the rivers which run across the high plain to the Danube. The tumultuous course, indeed, even of those few which are navigable beyond the edge of the Alps, prevents navigation among the mountains; most of them are useful for no other traffic than the floating down of wood, but it is precisely their value as obstacles to communication that renders them acceptable as boundaries. Thus the Lech served to divide Swabia and Bavaria; the Inn and the Salzach are at the present day boundaries of the Empires, while the Enns separates Upper from Lower Austria. The history of the many peoples and armies who have streamed from east to west through the Alpine foreland makes of these rivers, as it were, rungs of a ladder which the invader must firmly grasp before he can rest upon them; and undoubtedly the position between the high mountains, the Lech and the Danube, has contributed to form a definite kernel round which the largest of the South German States have grown. On this horizon Munich was the clearly marked centre, away from the Danube.

The stream of the Danube is principally fed from the Alps. It emerges as a very modest river from the limestone bed of the Swabian Jura, whose clefts have diminished its supplies; the large contribution of the Iller at Ulm makes a considerable stream of it, and the Lech and Isar so strengthen it that at Passau its average flow of water exceeds that of the mighty Inn, though in summer-time the Inn has the greater quantity of water. Fully four-fifths of the wealth of water belonging to the Danube at Vienna comes from the Alps.

The German Danube began as a channel of outflow common to the Alps and to the Inferior Ranges of mid Germany away to the north. It has probably flowed from the beginning on the boundary of the two districts. Now, however, it makes its way into the Jura in one or two places, and in many cuts off pieces of the Bavarian and the Bohemian Forest. These incursions into the northern mountain country are explained by the fact that the limit of the Alpine foreland formerly lay more to the north, over the site of the older mountains, and was only pushed so far to the south by the gradual denudation of the surface; thus many reaches of the Danube still cling to their original course, and pursue their work of erosion within the actual limit of the older mountains. There, too, the valley shows changes from narrow guts to broad and marshy basins, where the flow of the river is hindered by heaps of gravel brought down either by the Danube itself from its swift upper reaches or by tributary Alpine streams. Thus arose the Donau-Ried at Donauwörth, and the Donau-Moos at Ingolstadt; but the third Bavarian plain of the Danube below Ratisbon, which is the turning-point of its course, has received only fine alluvial deposits, by which it has been enriched.

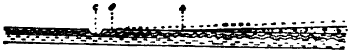


FIG. 11.—Entry of the Danube into the Jura.

a. Former limit of the Alpine Foreland.
b. Limit of the Alpine Foreland to-day.
c. Valley of the Danube.

At Passau the junction of the Danube and the Inn now occurs not in the open country, but in valley furrows dug out of the granite of the Bavarian forest. From this point to Vienna stretches of mountain and plain alternate in fairly equal proportions. In three flat basins, the middle one of which begins at Linz and includes the mouths of the Traun and the Enns, the waters of the Danube divide around islets overgrown with willows. The main stream, however, continues to press so much towards the right bank that, on the map, its course from one narrow and rocky spot to another looks like a chain hanging between two posts. The mountain banks, from between which dangerous rocks and rapids have recently been successfully removed, are gay with fruit-growing villages, convents, country-houses, and ruined castles famous in legend. A delightful boating excursion may be made down to the point where the Danube touches the Wiener Wald and breaks, at Kloster Neuburg, through the first chain of the Alps. The Bisamberg, on the left bank, is but a continuation of the Kahlenberg. The narrow opening between them is the entrance to the basin of Vienna.

This is an area of depression on the eastern border of the Alps, bounded by two lines of fracture, the position of which is marked by rows of hot springs. One of the lines coincides with that upon which the Alps break off to the east at Baden, the other with the north-western edge of the Rosalien ridge, diverging from the end of the Central Alps, and with that of the Leitha ridge. These mountains link the Alps with the Carpathians, divided quite superficially by the gap of Deveny where the Danube crosses the threshold of Hungary.

The basin of Vienna, in the midst of Central Europe, has always been a place of importance, both as to the history of its surface and as to the fortunes of its inhabitants. Even in the Middle-Tertiary Period, when the Miocene ocean still washed the outer rim of the Alps and Carpathians, an important communication existed at this point between that ocean and the waters which filled up the inner ring of the Carpathians and the basin of Roumania down to the Black Sea. As these wide expanses of country gradually dried, the Danube succeeded as the ocean's heir to the water-lordship of the lands laid bare. Then it became, within historic times, the leader of peoples coming from the Hungarian plains to South Germany, or in the contrary direction. By all, as soon as they resolved to settle permanently along the middle Danube, the basin of Vienna was recognised as the site for a centre of traffic of the most far-reaching importance.

Note on Authorities.—L. Ravenstein's general maps of all the Alpine districts, drawn from excellent original surveys, are admirable. They are on a scale of 1:250,000 and include 9 sheets of the Eastern Alps and 2 sheets of the Swiss Alps.

A geological map of the Alps (scale 1:1,000,000) has been compiled by Noë.

An English translation of "The Alps," by F. Umlauft, appeared in 1889.

The process of the folding of the Alps was analysed by Edward Suess in his *Enstehung der Alpen*, 1875; and by Albert Heim in his *Untersuchungen über den Mechanismus der Gebirgsbildung*, 1878.

Special details as to the formation and distribution of the Alps are furnished by C. Diener's *Der Gebirgsbau der Westalpen*, 1891; by the same author's *Der Gebirgsbau der Ostalpen* (Petermann's *Mitteilungen*, 1899, and *Zeitschrift des D. and Oe. Alpenvereins*, xxxii. 1901); and by A. Böhm (*Geographische Abhandlungen*, edited by Penck, i. 1, 1887).

The scenery of the Alps, considered from a geological standpoint, was described by Eberhard Fraas in 1892 and by Sir John Lubbock in the "Scenery of Switzerland," 1896; also by Edward Richter, *Geomorphologische Untersuchungen in den Hochalpen*, 1900.

For the Alpine Lakes, F. A. Forel's three volumes on *Le Leman* (1892–1902) are admittedly models. Lake atlases have been edited for Germany by A. Geistbeck and for Austria by Penck and Edward Richter (1895).

In regard to glaciers at the present day, besides the general works of J. Tyndall and A. Heim, Edward Richter's *Die Gletscher der Ostalpen* is of importance; his researches as to the snow line were carried on, in regard to the Swiss Alps, by Jegerlehner (Gerland's *Beiträge zur Geophysik*, v., 1902).

The Alps in the Glacial Age are discussed in a great work now being issued by A. Penck and Edward Brückner.

From the copious literature dealing with the flora may be distinguished, H. Christ's *Das Pflanzenleben der Schweiz*, 1879, and J. Ball's "Origin of the Flora of the European Alps" (*Proceedings of the Geographical Society*, 1879).

An inexhaustible mass of literature deals with the study of special portions of the Alps. In 1894 the Sixth International Geological Congress held at Zürich made a fine selection of the information stored in the volumes—which are more than forty in number—of the *Beiträge zur Geologischen Karte des Schweiz*, and published the selection under the title of: *Livret-Guide géologique dans le Jura et les Alpes de la Suisse.* Monographs of general geographical interest are those of Baltzer upon the *massif* of the Aar and the ancient Aar glaciers (*Beiträge*, xx., xxiv., and xxx.); of A. Heim upon the high Alps between the Reuss and the Rhine (*Beiträge*, xxv.); of E. von Mojsisovic's *Dolomitriffe von Süd Tirol und Venetien*, 1879; and of F. Frech, *Die Karnischen Alpen*, 1894.

Among studies of the history of the valleys, Wähner's *Geologische Bilder der Salzach*, 1894, deserves particular attention since it especially elucidates Fig. 9.

An excellent description of the Danube was published by Penck in 1894.

CHAPTER IV

THE CARPATHIANS AND THE HUNGARIAN DANUBE

THE Carpathians are the continuation of the Alps; yet they are an independent range, differing from the Alps in some particulars of historical development and internal conformation. Their deeply curved bow that runs from the Gap of Deveny to the Iron Gates at Orshova, does not exhibit the symmetry prevailing in the Eastern Alps. Of all the Alpine zones, one only is so connectedly developed in the Carpathians as to bear witness to the unity of the chain. This connecting zone is the *belt of Carpathian sandstone*, a continuation of the Northern Outer Alpine zone. That the mountains of the latter zone do not come completely to an end at the Wiener Wald is indeed shown by occasional low lines of hills rising from the Moravian plain. The Little Carpathians, however, which divide the March from the Lower Waag, are an evident continuation of the Central Alps. North of them, the two rivers are separated by a firmly locked chain of sandstone mountains. These are the Beskid Mountains, which, increasing in height as they advance towards the north-east, divide the Middle Waag not only from the March, but also from the Oder and the Upper Vistula. Even the Jablunka Pass, the easy passage from Hungary to Silesia, is surrounded by peaks from 4300 to 4600 feet high, and the Babia Góra overtops the limits of the forest by 1300 feet. The sandstone rocks which form the middle section of the Carpathians divide the sources of the Hernad and Theiss from those of the Wisloka and San, which are tributaries of the Vistula, and from those of the Dniester and Pruth; they also, like the Beskid Mountains, constitute the boundary of Hungary and of the basin of the Danube. This outer belt of sandstone welds together in a mighty ring the fragments of elder mountains that lie within its curve; its highest points are the grassy tops of the Czerna Hora (6652 feet), which rise from woodlands between the sources of the Theiss and Pruth. In the east of Transylvania, too, the valley basins of Csik and Haromsek, which feed the Alt, are divided from the Moldau by sandstone mountains.

In height, breadth, and connectedness, the wooded sandstone mountains of the Carpathian chain are far superior to their kindred of the Outer Alps; on the other hand, the northern limestone Alps are but faintly reproduced by a *zone of limestone crags* which, from the Middle Waag to Transylvania, appears on the inner side of the sandstone curve. In these crags we behold the remnants of an old mountain formation broken up by changes of the earth's shape, and further damaged, before and after the beginning of the Tertiary period, by breakers of the sea. The rocky fretted crags of limestone stand out singly or in long, but often broken, rows, amid the gentle forms of the surrounding landscape, where their very isolation makes them striking. The limestone formation of Nagy Hagymash, at the source of the Marosh, recalls the bold outlines of the Dolomites in the Southern Tyrol. Near Kronstadt (Brasso) rises the mighty bulk of the Bucsecs (8289 feet), the limestone nucleus of which is overlaid by conglomerates, incorporating pebbles from a seashore. This is the great final pillar of the limestone mountains.

Except the Bucsecs, none of these mountains can compare in height with the peaks of primitive rock which—though less firmly connected—repeat in the Carpathians the central zone of the Alps. In the north-west and the south-east rocks of high geological antiquity extend to considerable breadth, and rise to heights of 8000 feet. The two mountain countries of which they form the core—Upper Hungary and

Transylvania—are ethnographically entitled as homes of the Slovaks and of the Roumanians to be reckoned separately, while between them, up to the sandstone belt of the Middle Carpathians, stretches the Magyar Plain. The most beautiful part of the Carpathians is certainly the High Tatra, with whose pyramids of granite (7500 to 8700 feet) nothing in the Alps—unless it be the Aiguilles of Mont Blanc—can be compared. The valleys, once filled by great glaciers, are now sprinkled with dark tarns.

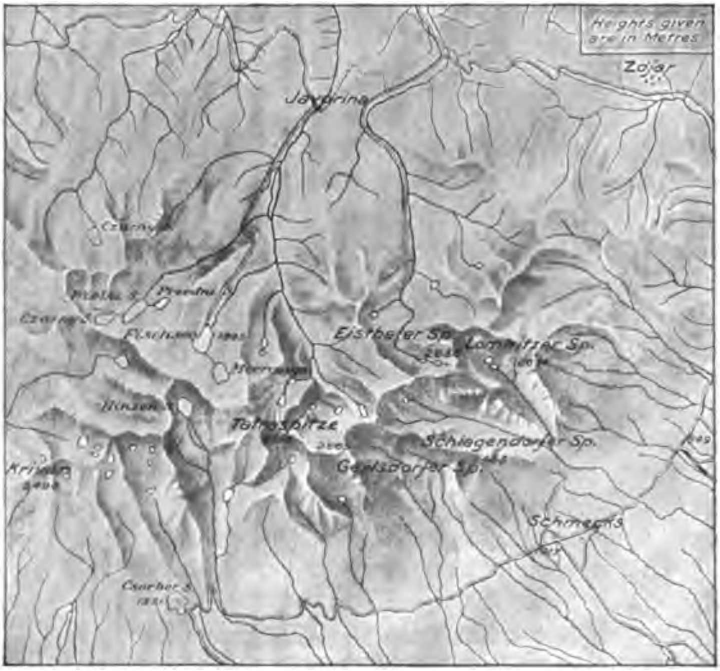

Heights given are in Metres
Zdjar
Javorina
Czarny
Fischsee
Eistbaler Sp.
Lomnitzer Sp.
Hinzen S.
Tatraspitze
Schlagendorfer Sp.
Gerlsdorfer Sp.
Krivan
Schmecks
Csorber S.

FIG. 12.—The Lake Region of the High Tatra

In Transylvania, the rock of the primitive formation divides into three groups, standing around the area of depression which occupies the centre of the province. To the north-east, between the rivers Theiss and Marosh, lie the Rodna Mountains; on the west, bounding that part of

Transylvania, are mighty mountains of which the nucleus is of old crystalline rock; but the greatest development lies on the south in a belt that runs 180 miles, starting from the Törzburg Pass at Kronstadt, going first to the west, then to the south-west and south, and ending at the Iron Gates. Amid these thickly wooded and thinly peopled South Carpathians three groups, marked by circular valleys, high lakes, and traces of glaciers, surpass the height of 8000 feet. These are the Negoi in the mountains of Fogarash, Mount Mandra, and the Retyezat. Remarkable transverse valleys push across the separate chains and sometimes across the whole breadth of these mountains. The Rothe Thurm Pass—the valley in which the Alt, as it comes from Hermannstadt (Nagy Szeben), cuts through the whole mass of primitive rock in order to reach the lower lands of Roumania—is perhaps the most wonderful trench by which any river of our continent manages to cross a line of ancient mountains. This lane amid the rocks has from very early times been an avenue of communication, and is easier of passage than the shorter valley in which the Scyl breaks through from the Petrosheny valley—a basin with valuable deposits of Tertiary coal—and escapes by a narrow gorge between very high mountains into Roumania.

Valleys of similar character occur in Upper Hungary. The Tatra mountains stand between the narrow valleys of the Arva and the Poprad; the former begins among the sandstones on the north, and makes its way southward through the older rocks to the Waag, but the Poprad has its source south of the granite mountains, and passes through a deep slit of valley on their east to reach its junction with the Dunaiets in the basin of the Vistula.

While these transversal valleys have no marked resemblance to anything in the Alps, the main lines of the Alps are recalled by the great longitudinal valleys that lie among and even in the very heart of the Upper Hungarian mountains. The Waag, the Upper Poprad, and the Hernad together form a curve of valleys of the utmost importance to inter-communication, and although the heights at the southern foot of the Tatra are considerable, the passages from the water-land of the Baltic to those of the Black Sea are extremely easy.

The part of the Alps least represented in the Carpathians is the *continuation of the southern limestone Alps.* Their rocks re-emerge from the ground of the Hungarian plain in the Bakonyan Forest near lake Balaton, and once more in the hills of the capital. But large distances separate the limestone mountains of Upper Hungary and Transylvania, both remarkable for far-famed caverns.

The inner side of the curve formed by the Carpathians is bounded by the lines of fracture surrounding the great area of depression which is the plain of Hungary. Opportunities of measuring the depth at which portions of the old rock are sunk below the surface occur but rarely. Some boring operations, however, undertaken in the Communal Park of Pest, only came on the dolomite, of which the hills of Buda (Ofen) are formed, at a depth of 3000 feet. This rock is thus sunk not less than 4300 feet below the level which it retains on the opposite bank of the Danube. It is from the lines of fracture along the dislocation that the famous hot springs of the capital rise. At other places, these lines of fracture running round the lowlands of Hungary have served as outlets for masses of rock in a state of igneous liquefaction. These rocks in noble and varied mountain forms now constitute the *innermost volcanic zone* of the Carpathian curve (Fig. 2), which far surpasses anything corresponding in the Alpine formation.

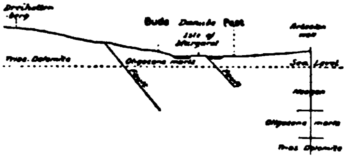


FIG. 13.—Section of the Ground under Buda-Pest.

The best of Hungarian wines used to come from the detritus of volcanic rock lying along the outer slope to the plain of the Danube and Theiss, but the phylloxera has now devastated many of the old and famous vineyards here.

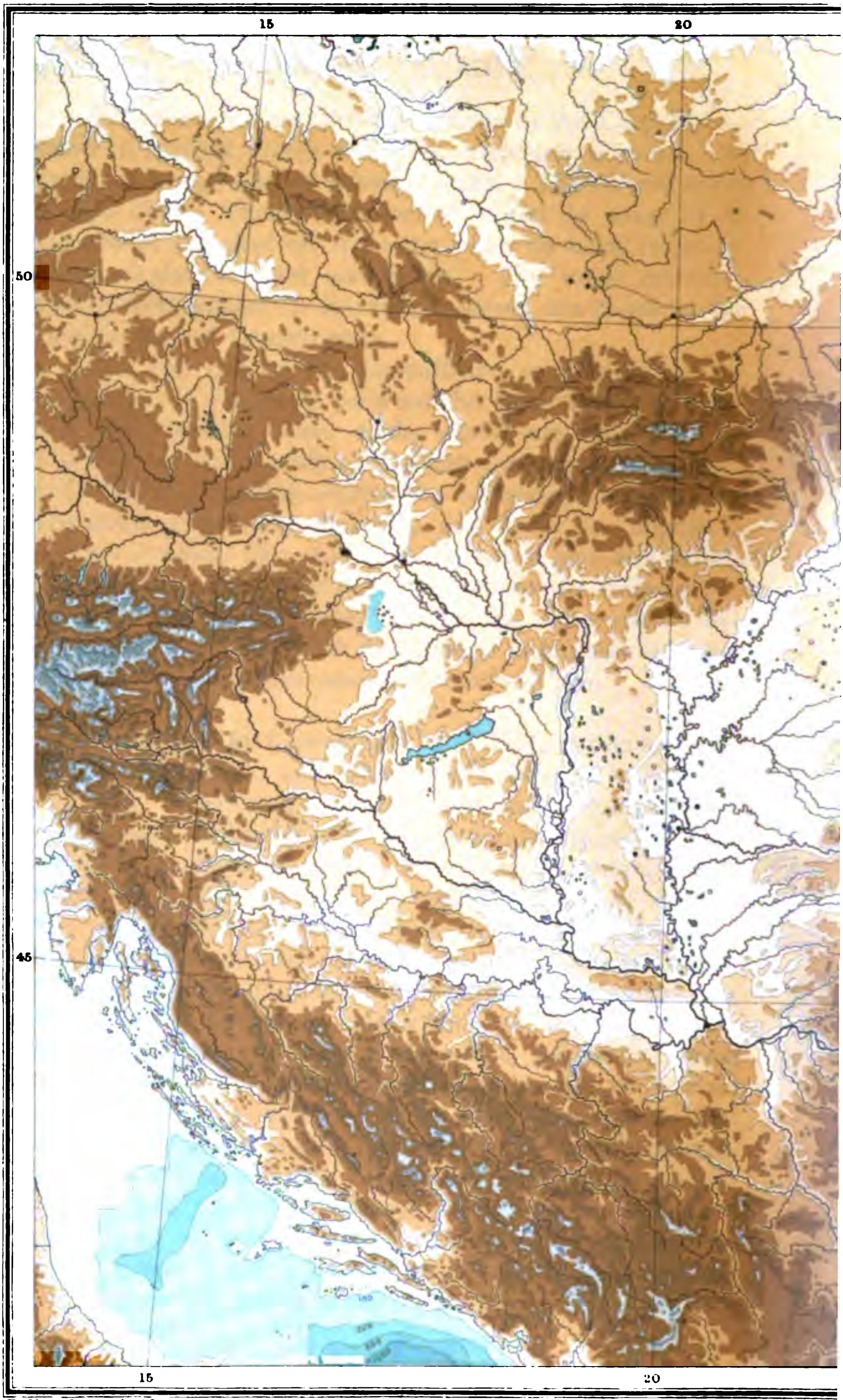
Even the very narrow centre-piece of the Carpathians, which is formed almost wholly of sandstone, does not lack an inner foreground of volcanic rocks. The valleys at the source of the Theiss (Maramarosh) and of some of its tributaries are shut off from the plain by such ridges as those of the Vihorlat and Gutin. The most extensive trachyte mountains in Europe, however, are those in the eastern part of Transylvania.

The last link of the Carpathians is formed by the mountains of the Banat between the Czerna, the Temesh, and the Danube. Their folds, which run nearly in the direction of the meridian, and are cut across in a wild ravine by the Danube, supply the connection between the Carpathians and the Balkans, and form so mighty a barrier between the plains of Hungary and Roumania, that traffic is unmistakably committed to the railway line at the "Porta Orientalis," or to the waterway of the Danube. The interior of the wooded mountains is populous by reason of their wealth of coal and iron.

THE HUNGARIAN DANUBE AND LOWLAND.

When the first period of the Tertiary epoch (the Eocene) was over, and when the folding of the rocks, working through long ages, had already built up the great, firmly-connected Carpathian curve, the outer mountains were still surrounded, and the area of depression within the mountain enclosure was still filled by a sea—the Miocene sea. It left behind the clays and sands of that soft undulating hill country, divided up by streams, which forms the inner and outer borders of the Carpathians, and in the bosom of which lie hidden great deposits of salt. The formation of these salt beds is no doubt connected with the slow disappearance of that Miocene sea which lost by degrees its free communication with the ocean and the connection between its several parts. The sea was replaced by brackish lakes, the extent and saltness of which continued to grow less, until the bed of the old waters was laid dry and became an arena for the action of winds and rivers.

AUSTRIA-HUNG.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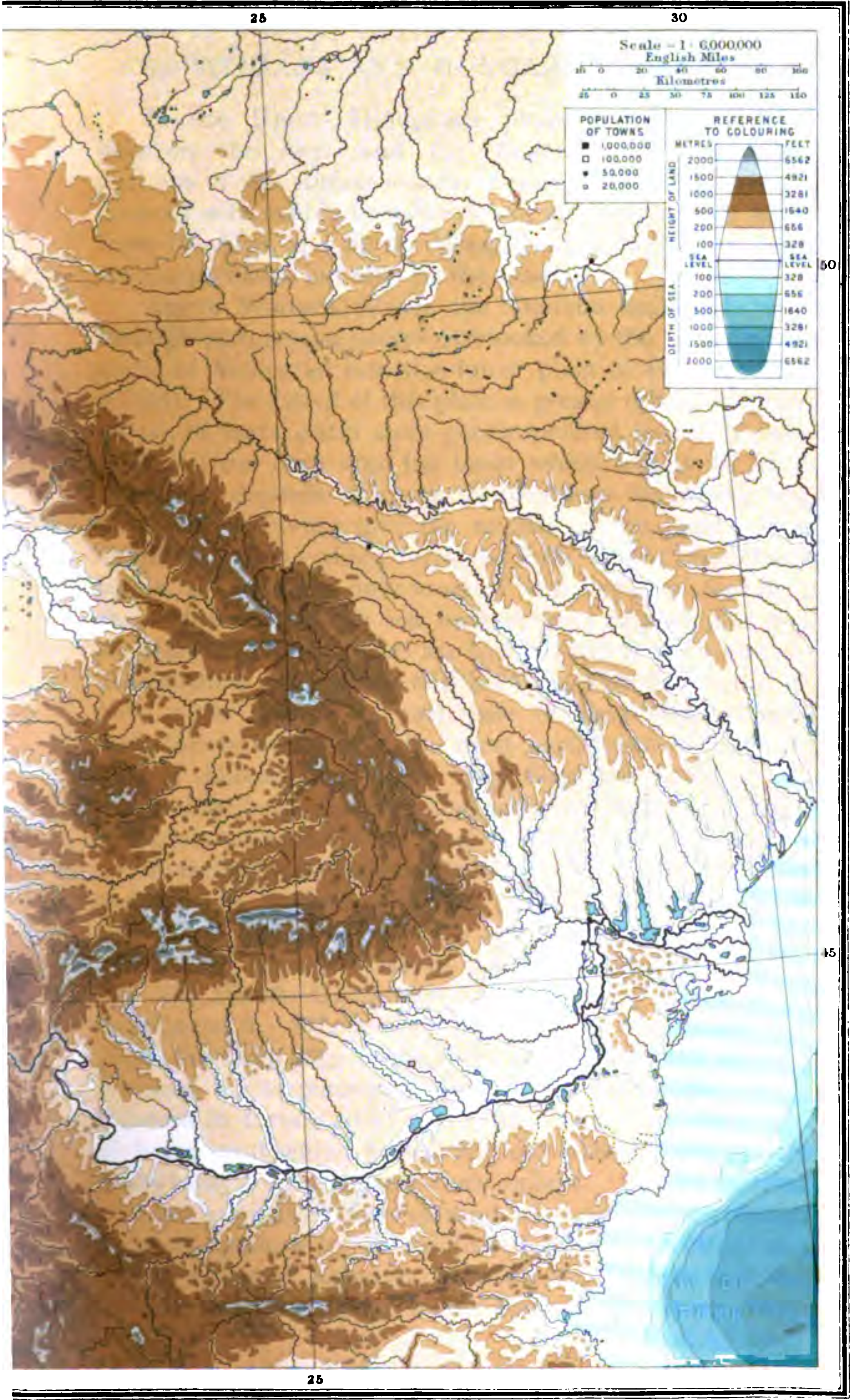
The Edinburgh Geographical Institute


25
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Scale = 1 : 6,000,000
English Miles
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POPULATION OF TOWNS
■ 1,000,000
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● 50,000
○ 20,000
REFERENCE TO COLOURING
METRES
FEET
HEIGHT OF LAND
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1500 4921
1000 3281
500 1640
200 656
100 328
SEA LEVEL SEA LEVEL
DEPTH OF SEA
100 328
200 656
500 1640
1000 3281
1500 4921
2000 6562
50
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25

In the Upper Hungarian plain (the Little Alföld) between the Alps and the Bakonyan Forest, great portions of the surface—some 6000 square miles—were covered with rubble brought down, not only by the Raab from the Alps, and by the Waag, Neutra, and Gran from the Carpathians, but also by the Danube.

Above Waitzen (Vacz) the Danube makes its way through picturesque gorges overlooked by the ruined royal castle of Vishegrad into the lower plain of Hungary (the Alföld). The extent of this plain is greater (36,000 square miles), its surface still more gently inclined, its soil of finer grain. How deep was the basin which had to be filled up by the deposits of rivers running into the Alpine sea, we learn by boring into the middle of the plain. The Tertiary schists, which form the hills of the mountain-frame, are in places only touched at a depth of 650 feet. It is obvious that the sea became gradually smaller and shallower. Its last traces are to be found in the innumerable shallow pans which still hold brackish quagmires, or have white crystals of carbonate of soda shining from their loamy beds. For the most part, however, the surface of diluvial clay, which once filled the whole of the plain, has been covered by later formations brought hither and shaped by the wind. Wide areas are covered by the fertile loess—a loam which in its dry state crumbles and can be rubbed into fine powder—the unstratified deposit of dust storms. This is not confined to the flat plains; the mountain slopes that surround the plains or rise like islands from them are half buried under great cushions of it. Where rivers have cut their valleys into the plain, the steep edge of the layer of loess on their inclines becomes a conspicuous feature of the landscape. Very different in form and in agricultural value are the dunes of loose sand which prevail without a break over many tracts away from the great river valleys. The two largest of these undulating lakes of sand have now been reduced in great measure by the continued efforts of cultivation; they are named Kumania, between the Danube and the Theiss, and Nyir — so called from long extinct birch trees—near Debreczin, within the northward curve of the Theiss. Acacias have given firmness to the moving hills, and large stretches of waste land have become fruitful as vineyards. In the sandy district of the Temesh Comitat, also, near the spot where the Danube leaves the Hungarian lowland, agriculture has pushed forward its conquests ; but this, nevertheless, is the strip of Europe which comes nearest to resembling the shifting sand deserts of other continents. The Hungarian sand dunes, however, do not lie in an entirely waterless landscape ; on the contrary they sometimes tend to hinder the outflow of water. Tracts that have become bogs occur in consequence in their immediate neighbourhood, and only by degrees have these marshes, with their thickets of reeds—a paradise for aquatic birds—been freed from water and given over to cultivation.

The very nature of the soil thus prevents a development of perfect sameness throughout this great lowland. The one characteristic common to all parts of it is poverty of wood. Each of the methods of making use of land occupies wide areas. There are still vast plains of pasturage, upon which herds of horses run free, and which supply food to hundreds of white, large-horned cattle and to myriads of sheep. But the picture of the Pusta which was true only a few decades ago, the much be-sung "steppe dreaming of the ocean," is gradually fading before the advance of agriculture. More and more farms are always being planted out in this vast territory by people from the populous but village-like towns. According to the soil, fields of maize and wheat, and plantations of hemp, tobacco, or vines, are always being pushed farther forward. Passengers travelling by express trains through this battlefield of human labour are astounded by the amazingly quick change of scenes.

The Danube and Theiss run parallel through the whole width of the lowlands, from north to south—two sisters differing in size and character. The fall of the Theiss in this part is scarcely half that of the larger river. The lower reach, in particular, from Segedin to the end of the Theiss—150 miles—has the minimum fall of only 15 feet. Any considerable rising of the Danube, therefore, at once drives back the Theiss. When the snows melt on the Carpathians around the Theiss basin, serious consequences soon ensue; through all the watercourses from the Hernad to the Samosh and the Körösh come vast quantities of water flowing simultaneously into the Theiss, while exactly at Segedin, the third river of Transylvania, the Marosh, falls in and further increases the flood. It was in such a conjuncture that, on the 12th of March 1879, Segedin was destroyed by an inundation. Stronger dikes have been erected as a safeguard against the recurrence of the danger.

The whole mountain course of the Danube from Baziash to Turn Severin is 85 miles long, of which the reach from Old Moldova to the lower end of the Iron Gates, still difficult and formerly dangerous of navigation, occupies 68. The romantic rocky avenue of this reach, combined with a profusion of changing pictures for the tourist, was an accumulation of all conceivable hindrances to traffic. The variations of fall were extreme, the total descent amounting to 83 feet; the width repeatedly changed, and varied from 160 yards to 2400; the depth, which at low water fell in places to no more than four feet—and that amid threatening rocks and shoals—increased in narrows where the stream was strong to more than 170 feet, and the bed of the river in such places lay lower than the level of the sea 600 miles away. The removal of the impediments was undertaken, at the Berlin Congress of 1878, by Austria-Hungary, and the enterprise has been carried through, at a cost of nineteen million gulden (more than £1,500,000). The aim pursued, which was the establishment throughout of a channel 200 feet wide and 6 feet 5 inches deep, has been attained. At the Iron Gate of Orshova, however, this could only be achieved by cutting out of the solid rock a canal 2700 yards long, which runs on the Servian shore and avoids the host of rocks amid which navigation had hitherto threaded its perilous course. In this canal, owing to the steepness of the fall, the stream runs with great rapidity—at the rate of from 13 to 16 feet per second. It has a depth of 8 feet 2 inches, which permits even the larger ships of the Lower Danube to come up to Orshova, the terminus of the Hungarian railway system.

The facilities for navigation will give life to the traffic of the country west of the Danube, as well as to the districts of the Danube and Theiss. The largest lake of Central Europe, however, the Platten See, or Lake Balaton, 266 square miles, is completely cut off from the Hungarian system of navigable rivers. It has no commercial importance, except in so far as fish may be caught and reeds cut in it. On the Drave navigation goes up to Legrad, and on the Save to Sissek, whence little boats ascend the Kulpa to Karlstadt. This point, distant by water 500 miles from the Danube and 1300 miles from the Black Sea, is but 40 miles away from the shore of the Adriatic. But the old legend of the Argonauts' voyage from the Ister to Istria will never come true. The mountains utter an inexorable veto.

Note on Authorities.—The most exhaustive work upon the Carpathians was written in the Polish language by Rehmann in 1895; this was made accessible to German readers by E. von Romer's abridgment (*Mitteilungen der Kaiserlich-Königlichen Geographischen Gesellschaft*, Vienna, 1896).

Among the best descriptions of separate parts are the works of V. Uhlig, *Geologie des Tatra Gebirges* (*Denkschriften der Kaiserlich-Königlichen Akademie der Wissenschaften, math. naturw. Klasse*, lxiv., lxviii., Vienna, 1897, 1899), and *Der Pieninische Klippenzug* (*Jahrbuch der Kaiserlich-Königlichen Reichsanstalt XL*, 1890).

The geographical division of the mountains is dealt with by Ferdinand Pax in the introduction to the *Grundzüge der Pflanzenverbreitung in den Karpathen*, 1898. Fig. 13 is taken from Szabo's *Geologie von Buda-Pest*, 1879.

The Hungarian Geographical Society is publishing a great general work about Lake Balaton (the Platten-See).

CHAPTER V

THE ILLYRIAN CHAINS, THE BALKAN, AND THE LOWER DANUBE

UNDER the name of the Illyrian Chains it may be permitted to include the whole of the mountains from the Adriatic to the Servian Drin, from the Isonzo to the Lake of Scutari, and from the Save to the Amselfeld (Kossovo Polye). Within this space, however, lie mountains differing greatly in antiquity and in formation, and contrasting widely in their external shapes.

The Karst is most clearly distinguishable. This name, which belongs in the first instance to the low mountains between Trieste and the basin of Laibach, has been extended by the scientific to the special characteristic forms of limestone mountains, the surface and interior of which have been affected by the solvent chemical action of water. Scenery of the Karst type prevails along the north-eastern shore of the Adriatic throughout a belt from sixty to ninety miles in breadth, extending from the plateau at the foot of the Triglav to the sterile highlands of Montenegro, which fall away in steps, not only westward to the sea, but also southward towards the Albanian lowland around the lake of Scutari and the mouth of the Boyana. This whole district consists chiefly of thick limestone rocks belonging to the middle grades of the sedimentary series (Cretaceous but also Triassic); and these deposits are corrugated in south-easterly folds that are softly rounded, not closely pressed together, and therefore more favourable to the development of plateaux than of narrow ridges. In the troughs between the folds lie long stretches of more recent sandstones, valuable because they retain water and are thus better suited to vegetation than the belts of limestone.

The surface of the limestone mountains has grown singularly rough and uneven under the solvent action of the water shed by the fiercest rainfalls of Europe. Sometimes the limestone is fretted by irregularly bordered furrows, between which project rough, sharp-edged ribs of rock. But more peculiar to the Karst than these stretches of "Karren," which we have already met on the Alps, are the eroded formations of the "dolines," rounded funnels or pans of very varied dimensions, which break the smoothness of the surface quite irregularly, many lying sometimes close together, like pock-marks in the skin of a human face. A close examination of the "dolines" intersected by a railway cutting, often shows us that they have been dissolved out of firm rock by the chemical destruction of its substance; they are funnels eaten out from above by waters which gradually worked their way to the depths, not through considerable openings, but through indistinguishable cracks. Even in Karst districts that have been overgrown by woods, this unevenness of the rocky substratum reveals itself in innumerable sharp edges of rock breaking through their mossy covering, and in the number of deep holes between which the way winds or ascends and descends. But the Karst in its barrenness is forbidding—a pathless wilderness of rock, a labyrinth of irregular forms that yet recur monotonously over wide expanses, dry and dead as a lunar landscape.

The stubborn intractability of the Karst to vegetation is due less to the absence of soft soil—for sometimes, when it is not swept away by storms, the hollows of the surface will be filled by "red earth" (*terra rossa*), a clayey residuum from the chemical decomposition of the rock—but rather to the more general, and far more serious, lack of water. Rich as are the rainfalls of the whole Karst district, the water quickly disappears into the clefts and holes of the fretted rock, and transfers its circulation, and a part of its geological action to the dark heart of the mountains.

The whole mass of the Karst is not indeed filled like a sponge with a network of hollows, but it is literally true that the interiors of the great mountains are pierced by large branching passages, which in one place will draw in and become narrow pipes, and in another will widen out into spacious halls. These are formed by the chemical and mechanical erosion of the water, which coming in from the surface, collects in great reservoirs, and makes lakes and rivers that, after flowing long in darkness, emerge as considerable streams. Thus a great part of the water system, which in general divides and moulds the face of the country, flows in the Karst district underground. There are large areas with no series of open, descending valleys; ill-developed, fragmentary valleys run in a deep furrow for a few miles, only to be stopped

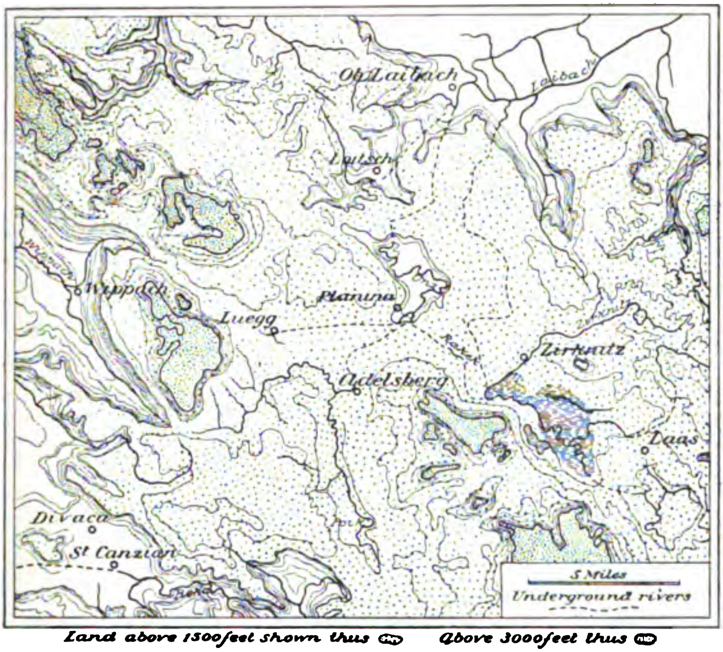

Ob. Laibach
Laibach
Loitsch
Wippach
Planina
Luegg
Zirknitz
Adelsberg
Laas
Divaca
St Canzian
5 Miles
Underground rivers
Land above 1500 feet shown thus
Above 3000 feet thus

FIG. 14.—The Hydrography of the Karst.

short by a wall of rock; their streams disappear into its caverns, and only come to light again at a considerable distance, under other names. Like Greece, which was the home of the belief in the transmigration of souls, the Karst country, from the Adelsberg grotto to the valley of the Zeta bisecting Montenegro, is full of rivers which disappear through the gates of the nether world to find a speedy resurrection, some of them repeating the process two or three times.

A particularly striking feature of these half hidden, half open watercourses is furnished by the so-called "polye," large valleys often measuring a hundred square miles and more, which mostly follow the main direction of the mountains, and as a rule are only drained underground through sink-holes. These holes or "ponors" open sometimes in the midst of the valley, sometimes on its borders, sometimes even at a distance up the sides. According to the capacity of the conduits and its relation to the water supply from springs, rivers, and rainfall, many of the "polye" are at certain seasons dry and at others covered for months by a sheet of water. The soil being fertile and abundantly watered, these depressions amid arid limestone ridges, are often populous and industrious centres. But their morasses are not infrequently hotbeds of fever, and they are sometimes imperfectly ventilated, whereas the mighty gusts of the Bora sweep wildly over the heights and rush down to the coast on to the warm sea.

Sometimes the longitudinal division of the land has been accentuated by the sea. Its waves fill submerged valleys, from between which rise light grey ridges of limestone in long islands like gnawed bones. Narrow streaks of sea divide Veglia, Arbe, and Pago from the steep chain of the Velebit, which runs along the edge of the Croatian mainland. The coast of Zara, continuing the line of these islands, still remains cut off from the open Adriatic by the outer chain of islands beginning with Cherso and Lussin. Punta Planca appears like a continuation of them incorporated with the mainland.

Immediately beyond this mountain projection, however, which receives the direct impact of the open sea, the coast again breaks up into the South Dalmatian archipelago, extending from Spalato to Ragusa. Under the shelter of the host of high islands lie many safe anchorages and good harbours. In several places a narrow entrance leads into an extensive enclosed basin, easily to be recognised as a submerged valley. In a few cases several *valloni* unite into branching inland basins. Thus, behind the harbour of Sebenico lies what was once a small second valley united to the first by a narrow channel, forming the basin into which the Kerka falls. The famous harbour system of the Bocche di Cattaro at the foot of the Montenegran mountains is made of three submerged longitudinal valleys connected by cross-way openings.

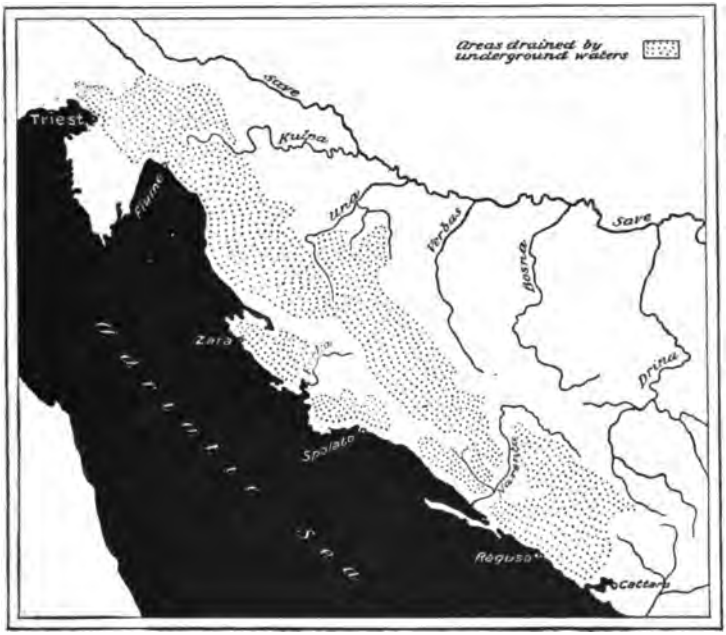

Areas drained by underground waters
Save
Triest
Kulpa
Fiume
Una
Verbas
Bosna
Save
Zara
Drina
Spalato
Narenta
Adriatic Sea
Ragusa
Cattaro

FIG. 15.—The Underground Drainage of Illyria.

The absence of valleys opening from the coast towards the land is an inevitable consequence of the Karst characteristics. To this general defect, which so retards the development and so lessens the value of many extensive districts, one exception, all the more important on account of its rarity, appears in the valley of the Narenta. One of the sources of this valley is at the foot of the Ivan Pass (3314 feet high), by which the easiest communication goes into the central basin of Bosnia. Thus, the wild gorges of the Narenta, traversing all the ridges of the Karst, open the only passage into the interior; but even of this a considerable part has only been rendered accessible by the expedients of modern engineering. The river itself, however, is always at work to destroy these advantageous conditions. Its alluvial deposits choke up the mouth, which lies amid unhealthy swamps. Moreover, the basin into which the Narenta falls, though beautifully placed among the mountains, is most undesirably cut off on the south and south-west by the long bar of the Sabioncello peninsula. No wonder that works are in progress to divert the Narenta railway farther eastward, and to employ Gravosa, the splendid harbour of Ragusa, as the future principal port of Herzegovina and Bosnia in the place of Metkovits on the Narenta, which is approachable only by small ships.

The boundary of the Karst in the interior is often very sharply marked. Sometimes a few steps will suffice to carry the traveller from the limestone desert to the carpet of turf in the wooded grove that spreads above the vigorous mould of other formations. In Montenegro the contrast between the scenery of the south-western and the eastern half is particularly striking.

The eastern highland of Montenegro is a continuation of the high mountains of Bosnia, which are as clearly divided from the western part of Herzegovina and from Dalmatia as the greenness of Styria is from the rocky deserts of Carniola. It is true that among these mountains mighty blocks of limestone occur, the age and formation of which (they are Triassic) vividly recall

Southern Tyrol. The inexhaustible variety, however, of the Tyrolese mountain forms is mainly represented here by only one prevalent pattern—broad bulky stocks with an uneven surface, but without lofty peaks. Below and between such limestone masses, appear older schistose mountains with ore in their veins and woods upon their summits. The wildest of these mountain blocks (all over 7000 feet high) surround the upper reaches of the Narenta. The highest peak bears the melodious name of Tshwrstnitsa ; it is less well known and of less importance to science than the Byelashnitsa, at the summit of which a meteorological station has been erected. The north-eastern portion of Bosnia bordering upon Servia is filled by thickly-wooded mountains of moderate height and gentler forms. These are framed of conglomerates, sandstones, and slates, the age and formation of which belong to the same stage as the Carpathian sandstone. Towards the south-east, however, the Triassic mountains of Bosnia with their limestone crowns come to an end, shut off by the broad tongue of primitive rocks which stretches from Macedonia northwards towards Servia.

THE PRIMITIVE MOUNTAINS AND THE MAIN VALLEYS OF SERVIA AND BULGARIA.

The greater part of the extensive Morava district is dominated by a broad wedge of old mountains, pushed out between the Illyrian chains and the Balkans by the primitive mountain formation of Thrace and Macedonia. In Servia, the primitive rocks fall mainly into ridges stretching to the north-west, enclosing woody heights and fertile valleys full of maize fields and plum-tree plantations. On the highest of these ridges rests the south-western boundary of Servia, but not the boundary of the Morava basin. On the contrary, two of its sources, the Ibar and the main branch of the Morava river, force their way through the highest portion of this boundary ridge into Turkish territory. The Ibar drains the Amselfeld (Kossovo Polye), the field of battle where enemies have so often met to decide the fate of Servia. Upon the bank of the river, at the northern end of the basin, the Turkish railway system begins at Mitrovitza. The narrow trough of the Ibar valley, from this point to the Servian frontier, has hitherto been impassable. Farther east, however, a mountain road leads directly over from Servia into the Amselfeld. The Austrian scheme for continuing the Bosnian railway through the Drina district to Mitrovitza, and so opening a way of its own to Salonica, promises to give greater importance to the line running across this depression. The Amselfeld railway has no serious difficulty in reaching the upper basin of the Vardar; there it joins the Belgrade and Salonica line, which, crossing the heart of Servia by way of the wide and open Morava valley, runs beside the river to reach Turkish territory and the watershed. The upper valley of the Morava furnishes the easiest passage through the ancient mountain groups at the core of Sclavonic Southern Europe. Its importance is increased by the height and difficulty of the rising mountains into which this group expands eastward, on the northern confines of the Turkish Empire towards Bulgaria and Roumelia. From the south, it is true, the upper reaches of the Struma Valley, whose sources lie on the Vitosha not far from Sofia, ascend between mighty mountains into Bulgarian territory. But the road has to traverse difficult gorges before it attains to the upper basin of the Struma at the hot springs of Köstendil, whence it proceeds over a high pass at the west of the Vitosha (7518 feet high) to Sofia. More to east the Rila (9590 feet high) far surpasses the level of the pine woods and obtains a more distinctly Alpine character than any other of the mountains of the peninsula. Its fields of snow shine afar until late in the summer. The northern slopes of its broad ridge are divided by many valleys, and upon their gradations are scattered more than a hundred little lakes, as well as many unmistakable traces of glaciers. The eastern continuation of the Rila, the Rhodope chain, heightened by copious eruptions of volcanic rock, forms the southern rim of the Roumelian basin through which the Maritza flows.

This area of depression lies amid the old mountain groups that feed the rivers of the Ægean Sea, and occupies an important boundary position similar to that of the Morava valley. The roots of these two valleys, however, and the sources of the rivers Morava and Maritza, are separated by the lofty mountains around the head of the Struma. There is, nevertheless, a slender passage between the main valley of Servia and that of Roumelia. It is formed by the central link in a highly remarkable series of longitudinal valleys embedded in the Balkan system, which encircle the main line of the Balkans, running in a wide curve from the neighbourhood of the Black Sea to the Danube. The Eastern Roumelian portion of this great chain of valleys follows a line of fracture at the steep southern foot of the Balkans, marked by numerous hot springs; the Tundja collects here the waters destined to enlarge the Maritza at Adrianople. Through the north-western part, belonging to Servia, flows the Timok; while the central or Bulgarian section, the basin in which the Isker rises, is the plain of Sofia. The importance of this plain depends upon the convergence of many roads. All are subordinate to the main line from Belgrade to Constantinople, whose principal stations are Nissa, Sofia, and Philippopolis, divided from one another by low barriers.

While the mountains between the Maritza and the Tundja, and also the bases of the Vitosha, show themselves by their formation, age, and shapes to be outposts of the old Thracian and Macedonian group, we shall find that the limestone mountains of East Servia, between the Timok and the Morava, have extensive plateaux and present the characteristics of the Karst. In these latter we recognise a continuation of the mountains of the Banat. As the contour of that chain is closely conjoined to the primitive mountains of Transylvania, so in like manner does the East Servian Karst, between the Timok and the Danube, join the northern end of the main Balkan chain.

THE BALKANS AND ADJACENT COUNTRY.

Like the Alps and the Carpathians, the Balkans have been raised by a mighty folding of the strata, but they clearly differ from them in the dissimilar development of their northern and southern footlands. On the north of the Balkans lies not a foreland, levelled by the deposit of later rocks, but the Bulgarian tableland trenched by the Balkan streams, with surface formations (Cretaceous) which are older than the completion of the mountain foldings. On the south, the Balkans are cut off by lines of fracture, though the descent towards these does not, as in the case of the Po and the Theiss, lead to an area of depression in the form of a wide-spread plain, but into a land of lively and varied contours, where the remnants of ancient mountains rise amid valleys and basins. It might at first appear remarkable that this fractured edge should occur, not on the concave but on the convex side of the Balkan curve. The abnormality, however, disappears when we perceive that the Balkans are but the western wing of a great chain of mountains, continued in the Crimea and the Caucasus, the combined curve of which opens southwards towards the depth of the Black Sea. It is the concave side of this now disrupted range which is marked by fractures and depressions.

The internal structure and physiognomy of the Balkans vary in the extent of their long course, and a division into three sections appears desirable. The Western Balkans are bounded by the two famous gorges in which the Danube and the Isker force their passages, the latter, as Herodotus says, "splitting the mountain through the middle." This section, in which the heights gradually fall to moderate hills, is traversed by the Timok, along which a whole group of Roman roads, meeting at Nissa, passed towards the gate of the Danube and Transylvania. But immediately south of the Timok valley the Western Balkans (Stara Planina) close to a single ridge, and the roads from Nissa and Sofia to Lom Palanka on the Danube are obliged to make a considerable ascent in order to surmount the barrier.

In the Central Balkans the intensity of the mountain folding was such that, in spite of the immense denuding process of long ages, great broad summits of primitive rock, such as the Yumruktshal (8104 feet), still remain. Few of the passes, drenched with blood in many campaigns, will in the future, after the boring of the tunnel at Orkhanie, be of importance, not even the famous Shipka (4375 feet). The ascent to this from Ternova, the old royal capital of Bulgaria, by way of the Yantra valley, is easy, but on the southern slope the road descending to the rose gardens of Kazanlik follows long windings on the face of the steep incline.

The precipitous southern slope, the descent of which from the Central Balkans to Roumelia is everywhere rendered delightful by a milder climate and a more striking flora, is also a characteristic of the Eastern Balkans, where the lines of fracture on the southern edge are marked, not only by hot springs, but by accumulations of volcanic rock in the mountain country between Yamboli and Burgas, the Tundja and the Black Sea. In other respects the eastern wing of the Balkans is very clearly distinguished from the western wing of the same mountains. For while in the former, and especially on its steep southern edge, old schists and gneiss are extensively present, the prevalent rocks throughout the eastern wing are sandstones and schistous marls that recall the Carpathian sandstone. These formations, pushed together into folds, compose not a single lofty ridge, but several parallel chains of moderate height. The mountains gain in breadth and lose in altitude. The Demir Kapu (Iron Gate), 3600 feet high, between Sliven and Ternova, which may be regarded as the boundary of the Central Balkans, is the last pass in which one single severe ascent is necessary—but also sufficient—for the passage from Roumelia to Bulgaria. From this point towards the east the height of the mountains drops rapidly, and an abundance of roads, none of which rises to above 1600 feet, take their way through the wooded undulations of the hilly district traversed by the Kamtshik. At this point the Balkan chain ceased to constitute a strong protection to Roumelia, and required in its turn to be protected by the Bulgarian quadrilateral. As the eastern close of the Balkans is marked on the coast line of the Black Sea by the promontory of Cape Emineh (Emon), beset with Greek monasteries, so is the great longitudinal valley that follows the foot of the mountains represented by the bay of Burgas. Shallow lagoons surround the shore of the Roumelian harbour ; but the harbour of Bulgaria, Varna, no longer belongs to the mountain region, and is formed by the widened mouth of a river indenting the uniform eastern rim of the Cretaceous Bulgarian tableland.

The northern foreland of the Balkans widens towards the east, and is traversed by the rivers Isker, Vid, Osma, and Yantra, which carry their wide washed-out valleys across it. These valleys, framed by steep rims, change their direction repeatedly, and are rather barriers to communication than roads, traffic going preferably by way of the free high-flats between. The surface of the Bulgarian plain is extremely monotonous, variety being given only by the furrows of the valleys, and by the rather surprising appearance, to west of the Yantra, of a row of basaltic cones, which mark a hidden line of fracture. Except the woodland of Deli Orman, most parts of the plain resemble the steppes, whose character entirely dominates the Dobruja.

The deep "loess" covering of the Dobruja, whose dust is a plaything for the winds, veils a most varied mountain formation. The rocky undulations of the country are not outposts of the Carpathians or of the Balkans, but present, in the interval between them, a noteworthy example of the blocks left behind by an older conformation of the earth of Europe. Bare and barren of water, though amidst streams, swamps, and lagoons, dominated alternately by parching sunshine and by bitter winter chills, swept by unkindly winds, and yet not healthy, the Dobruja to-day, as in the days of Ovid, is a cheerless country, "Loca felici non adeunda viro." Yet how promising is the position which it occupies at the mouth of the greatest river of Central Europe.

THE LOWER DANUBE.

The Danube has been described as the river which connects basins. In the region of its lower reaches it continues to have in some degree the character of a trough bordered on every side by higher lying land. Between the rocky heights in the north-west of the Dobruja and the farthest outposts of the Carpathians lies an interval scarcely fifty miles broad. From this gap, however, the domain of the Lower Danube extends a long side wing towards the north, and includes the districts of the Sereth and the Pruth. Unlike the bottle-shaped upper section of the Danube or the vast rectangle of the middle section, which spreads between the four corners of the Venediger, the Schneeberg near Glatz, the Czerna Hora, and the Shar Dagh, the Lower Danube basin has a heart-shaped form. The kingdom of Roumania, whose outline is drawn by the Danube and the Pruth, lies on the map like an eagle with spread pinions bearing down from the Carpathians to the Black Sea.

At its emergence from the Iron Gates, the Danube lies but 120 feet above the sea-level; the 600 miles of its lower course can have therefore but an extremely slight fall. Nevertheless, thanks to its great body of water, further swollen as it goes on, it runs not sluggishly, but with great force between the high bank of the Bulgarian plateau and the flat lowlands on the Roumanian shore, which in times of flood it widely overflows. The unequal distribution of alluvial deposits at this part, both by the main stream and by its tributaries, has caused these latter to be diverted, and swamps and lakes to be formed along the Danube. Only at a few places does the "loess" terrace of Roumania come close to the river and offer solid crossing places; these are generally marked by a pair of towns facing each other from opposite banks. On the most southerly stretch of its course the stream of the Danube often widens to great breadth or divides around willow-grown islands. Places occur in which at low water a navigable depth of six and a half feet can hardly be counted upon. These difficulties, however, cease as soon as the largest streams from the Balkans and Southern Carpathians have been included. But now the river grows too strong for the ruling care of the State in which lie its lowest reaches. Below Silistria, where the Danube passes entirely into the kingdom of Roumania, begins the plexus of streams that surrounds the western and northern sides of the Dobruja. The landscape of the northward flowing reaches down to Braila, the principal centre for the exportation of Roumanian grain, is dominated by the two long narrow islands of Balta, which are permanently intersected by lakes and dikes, and at high water mostly covered by the river. At Galatz, between the confluences of the Sereth and of the Pruth, the river begins to turn eastward. From this point the left bank is bordered by the lower ends of long lakes that run far up into the land, due to streams which, being barred from the river by banks of alluvium, have been driven back and have overflowed their valleys. At sixty miles' distance from the sea this amphibious country merges into the delta of the Danube. The strongest stream is that on the north, the Kilia, which conveys two-thirds of the waters of the Danube north-eastward along the boundary of Roumania and Russia to the many branching mouths. The weaker stream of St. George, running to the south-east, soon divides a second time. The principal part of the traffic is carried not by the main right-hand branch, but by the Sulina, which runs through the middle of the triangular swamp (900 square miles in extent), and retains but seven per cent. of the entire volume of water. This channel is preferable as being less winding and shorter, but especially because less silt is carried along it, and its mouth therefore suffers less change of conformation than is the case with the larger branches, which bring down great masses of alluvial matter. These causes have led to the concentration upon the Sulina of all the measures taken for the development of successful navigation on a large scale. The minimum depth, which was naturally but seven feet, has been increased to twenty. Long dikes erected at the mouth serve several useful ends; they ensure the removal of the silt to deep water, where it may sink and do no harm; they prevent also the mouth of the river from becoming sanded up by the sea current along the beach, and they enclose the harbour into which comes the traffic of the regions served by Central Europe's largest river. This traffic, however, enlivens only the main course of the Lower Danube and not any of its tributaries. Only in the far future can we look forward to the regulation of the Pruth, which might easily be made a profitable water-way, if it were not the boundary of the Russian Empire.

Note on Authorities.—Various researches into the physiography of the Illyrian chains have been collected into a monograph by J. Cvijic: *Das Karstphaenomen* (*Geographische Abhandlungen*, edited by A. Penck, v., 1893).

In regard to the hydrography of Carniola, Urbas may be consulted (*Zeitschrift des D. und Oe. Alpenvereins*, viii., 1877).

The formation and topography of Montenegro were not made known until considerably later by the researches of E. Tietze (*Jahrbuch der Kaiserlich-Königlichen Reichsanstalt*, xxxiv., 1884), and of K. Hassert (Supplement No. 115 to Petermann's *Mitteilungen*).

The pioneers in scientific investigation in Bosnia were E. v. Mojsisovics, E. Tietze, and A. Bittner. A general view of its orography is given by Lukas (*Wissenschaftliche Mitteilungen aus Bosnien*, viii., 1901).

The earliest geological sketch of Servia was presented by Zujovic (*Jahrbuch der Kaiserlich-Königlichen Geologischen Reichsanstalt*, xxxvi., 1886).

The exploration of the Balkans, begun by Ferdinand von Hochstetter, was carried on by F. Toula, 1875–1895 (*Denkschriften der Kaiserlich-Königlichen Akademie der Wissenschaften math. naturw. Klasse*, xliv., lv., lvii., lix., lxiii.). The best authority upon the Lower Danube and the Dobruja is K. Peters *Die Donau und ihr Gebiet* (*Denkschriften der Kaiserlich-Königlichen Akademie*, xxvii., 1867).

CHAPTER VI

THE BLOCK MOUNTAINS AND TABLELANDS OF CENTRAL EUROPE

EASTERN OUTPOSTS.

IF we follow the bends in which the chains of the Alpine system curve from the Ligurian Sea to the Black Sea, we can hardly fail to suppose that some parts of these windings mark the places where the folds that were pushing forward yielded to the opposing masses of older rock. How striking is the curve in which the ridges of the Eastern Alps and the Western Carpathians swing round the southern and eastern rim of the old Bohemian group! How the Jura curls round the southern border of the Black Forest!

Similarly, on the outer edge of the Carpathians lie two blocks of old country whose horizontal strata the waves of the Alpine fold did not succeed in penetrating. One of these, the plain of Podolia, is an integral part of the old Russian tableland, a piece of Eastern Europe. The partition of the kingdom of Poland, however, has brought the boundary of the Empire of Austria up on to this plain. South of the railway from Lemberg to Brody, its northern rim rises above the sources of the Bug, forming the southern border of the Vistula basin. From this edge the streams, including the boundary river Zbruz, run southward, cutting their channels deeper and deeper, until they enter the chief river of Eastern Galicia, the Dniester. A long stretch of the south-easterly course of this marks the south-western boundary of the Podolian table. It is not until beyond Halicz, the place from which all Galicia took its name, that the Dniester itself enters the plateau. The meanderings which it began by describing upon the surface have been bitten deeper and deeper into the strata ; on the steep faces of its valley—sometimes as much as 500 feet high—their sequence lies exposed ; at the top "loess," accumulating in the storms of the bare steppe ; then marine deposits from the Tertiary and Cretaceous periods ; and lowest of all, the old red sandstone. Under the valley-brinks cluster well-sheltered towns and villages, but upon the table itself (1000 to 1300 feet high) the steppes extend without a tree, and generally without the break of any settlement; the greater part has now, however, been brought under the plough and converted into waving cornfields.

As the Upper Dniester, above its entrance into the plateau, and then the broad valley of the Pruth divide the Carpathians of Eastern Galicia from the Podolian table, so in the west the Vistula divides from the Beskid mountains and their flat foreland the ancient upland emerging from under the broad undulations of Poland and Upper Silesia. Between Sandomirz and Kielce, old slates, quartzites, and sandstones lift their soft ridges from the Cretaceous formation prevailing in the south-western part of Poland. These are but the uppermost and most recent of the horizontally laid strata composing the table of Poland and Upper Silesia. The limit of the limestone deposits of the Polish Jura is an escarpment formed by denudation, and appears as a cliff crowned by the monastery of Czenstochow, and at the foot of the cliff runs the Upper Warta. Westward, Triassic formations prevail throughout the northern half of Upper Silesia. In them also the limestones form a steep slope towards the valley of the Oder, and gain impressiveness from the position of the little Annaberg, which is the most easterly basaltic summit in Germany. This edge, however, does not run from the south-east to the north-west like that of the Jura, but from east to west; the great coal-basin of Upper Silesia lies at its southern foot. The mighty coal measures, in some places exposed, in others covered by a slight mantle of newer deposits, present themselves in the most favourable conditions for exploitation. Only on the south-west of the basin, at the border of the Sudetic mountains, are the strata raised on end or overturned. At this point begin the mountains of Middle Germany.

BOHEMIA AND SURROUNDING UPLANDS.

In the chart of Central European waters, hardly any phenomenon is more remarkable than the irregular course followed by the northern boundary of the Danube basin. The sources of the Naab and of the March lie north of the fiftieth degree of latitude; the districts of the Upper Palatinate and Moravia, through which they flow, slope southward towards Ratisbon and Vienna. Between these two provinces, however, which belong to the Danube basin, lies a broad uneven mass of land, the waters of which run northward from latitude 48½°, and are collected in one principal channel, that of the Moldau, which follows the line of the meridian. This land is the old Bohemian block, in the midst of which are found oceanic formations of very great antiquity, the oldest known in Europe, dating from a period in which this region was covered by a deep sea with blind animals. The coal-beds of Pilsen bear witness to a later continental period, for they were formed in an inland lake. The whole country round became one of the old cores of our continent that have maintained their place through countless ages. Only the gentle slopes in the northern part of the block have in later epochs been overflowed sometimes by a sea coming in from the north. The freestone which characterises extensive tracts of North and North-Eastern Bohemia is a formation belonging to the shores of that sea, which in the Cretaceous period covered not only large parts of North Germany, but also this portion of old Bohemia. In those days Bohemia was not a country enclosed on the north. Even after the beginning of the Tertiary period, the lakes and swamps in which the Bohemian lignites were formed extended from the interior to stretches of country now belonging to the surface of the Saxon Erzgebirge.

The full development of the great differences in height between the mountainous northern border and the low-lying interior of Bohemia was effected only in the middle and later Tertiary epochs. On the southern side of the Sudetic mountains, geologists have discovered great lines of fracture, clefts of which the southern lip has sunk to a lower position. But the faults which cut off the steep southern border of the Erzgebirge from the mountains of Karlsbad cause far more striking effects in the landscape. Along these fractures, by which the courses of the Eger and the Biela were determined, occur many hot springs and carbonic acid springs, while clusters of slender pillars and domed summits bear witness to the volcanic activity, for which a path was opened in the Tertiary period by deep-reaching fissures. This zone of bold mountains with a volcanic origin continues north-eastward through Lusatia to Lower Silesia, and marks the limit of the Sudetic mountains near Zittau. The space, however, between them and the Erzgebirge is not left open; in the interval lie the sandstone mountains, into which the Elbe has cut the gorge that serves as an outflow channel for all the rivers of Bohemia.

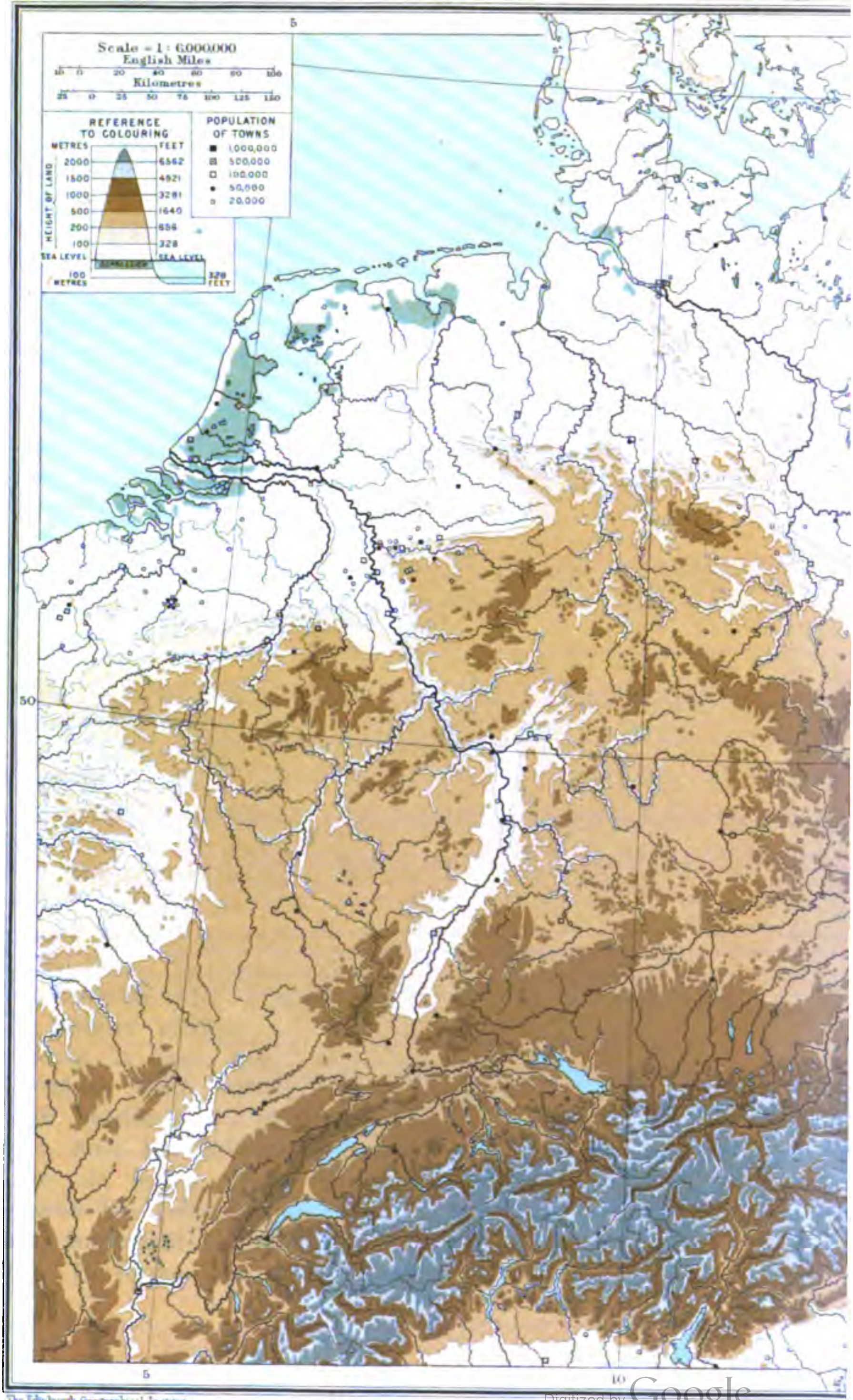
The rivers complete their union in the fruitful basin of Melnik and Leitmeritz, where they were at one time gathered into a great lake. The principal river is certainly the Moldau; the Elbe brings only one-third, while the Moldau brings one-half of the whole volume of water that passes from Bohemia to Saxony. The large boats which carry the Bohemian lignites and garden produce to North Germany begin their course at Leitmeritz; the future may see Prague become the southern trading point of the Elbe district, and perhaps even a great system of canals carrying trade from the Moldau across to the Danube by way of Budweis and Linz. A wide passage-way stands invitingly open between the broad and ancient ridges at the south-eastern end of the Bohemian Forest.

These latter mountains, which form the Bavarian face of the old forest fastness of Bohemia, are cut through to the north of their centre by the often-disputed Gate of Furth. This pass lies barely 1500 feet high, and its direction is exactly that of the line between Ratisbon and Prague. As the towns of Eger and Budweis grew up on the outskirts of the Bohemian Forest along roads that pass round its mountains, so Pilsen grew up at this passageway of nations. Southward of it lie the broadest and highest portions of the chain, long ridges the summits of which are rounded and seldom rocky, the highest of them, like the Arber (4780 feet), rising above the tree-line and having little dark tarns lying in rocky nooks upon their slopes. Beyond, to the south, lies the Bavarian Forest, lifting its steep summits above the Danube valley and the foreland of the Alps.

At the north-west corner of Bohemia stands the Fichtel Gebirge, a modest range of wooded heights easily encircled by the roads from Eger into the Upper Palatinate and into the Vogtland.

Very different from the radial river system of the Fichtel Gebirge, and very different too from the longitudinal valleys between the broad ridges of the Bohemian Forest, is the disposition of watercourses in the Saxon Erzgebirge. The Eger, and farther east, the Biele, running parallel to the mountains on their steep southern border, collect the streams which in narrow valley chinks come down the majestic mountain-side. On the north, however, where the high rim of the block softens to rounded heads, the courses eroded by the rivers of Saxony down the gentle undulating slope lie at first in wide hollows, then in deep, narrow gorges spanned by bold railway bridges, and lastly, as they approach the lowlands, in open dales again. The tilted plain which determines their direction is an abraded surface, a wreck produced by destructive atmospheric influences, which have left nothing remaining but the foundation of an old folded range that ran to the north-east. Between the belts of primitive rock lie basins of sediment, important because they contain thick seams of coal. In former times, the primitive rocks with their

GERMANY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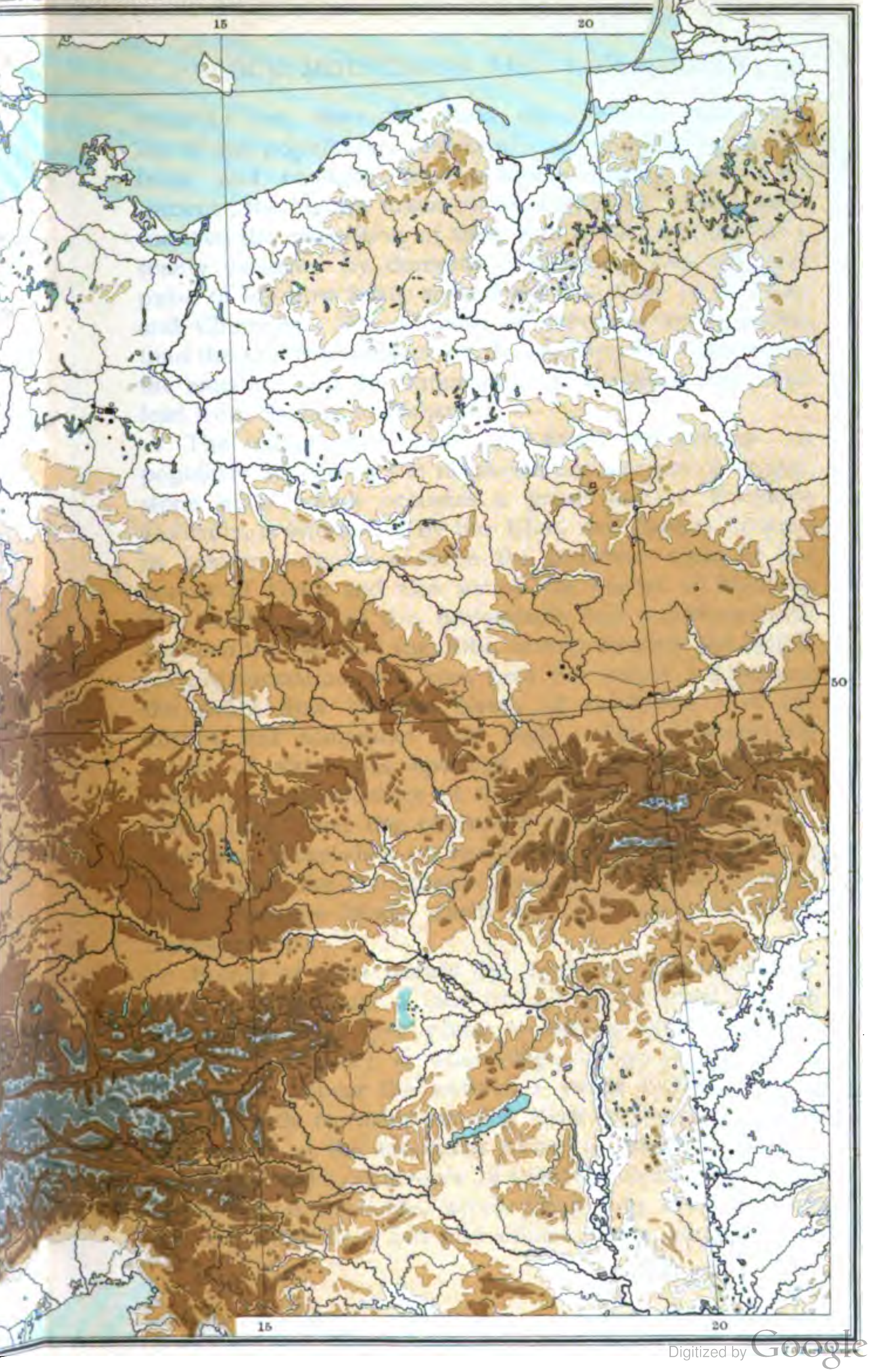
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veins of ore, were the basis upon which rested the life of the population. Silver-mining peopled the mountains, and brought into existence, among its loftiest summits, the highest towns of the continent. These have survived the exhaustion of their vital nerve, and eke out a scanty existence by domestic industries. The strongest pulse of life now beats around the coal-beds of Zwickau and Chemnitz. The position of industrial towns, rather than the uniform contour of the country, has determined the situation and the importance of the many ways that lead from Saxony to Bohemia.

The inappropriate name of "Saxon Switzerland" is popularly applied to the north-western portion of a sandstone mass which occupies a great part of Northern Bohemia, is intersected by the Elbe, and pushes forward its eastern outposts between the primitive rocks of the county of Glatz and also across the border of Moravia. The middle part of this horizontally laid sandstone table between the Iser and the Elbe, clearly displays the simple plateau formation, but even here the waters intersecting the strata flow between banks of sandstone that are abrupt and sometimes very high. The disintegrating action of water has operated most strongly, however, upon the circumference of the table, as in the "Saxon Switzerland" and the celebrated rocky scenes of Adersbach and Wekelsdorf on the border of Silesia; while in Silesia itself, the Heuscheuer furnishes a similar example of a freestone block which has undergone profound disintegration.

Scenes of great beauty are presented where a mighty river flows through a lane of pale proud rock; where wild rocky walls give place to smiling glades along a friendly river-bank; or where, high on the summit of the Königstein, appear the walls of a virgin fortress, with a peaceful little township sunning itself on the shore below. The variety of the mountain forms is greatly increased, however, by the occurrence of volcanic rocks, slim pillars of basalt and phonolite, which bring into the landscape not only other lines but also other colours, whether it be the gloomy darkness of their naked stone, or the cheerful woodlands glowing in the fertile mould of their detritus. In particular, the borderland of Lusatia towards Bohemia gains from the presence of such bold intruders an unusual wealth and variety of forms.

Above the softly undulating profile of the broad Iser chain, with its high, marshy, dividing valleys, rises to eastward the lofty ridge of the Riesen Gebirge, with summits crowned by broken rocks. Around the south side of its granitic centre lies a mantle of old slates, divided through ten miles of their extent by the longitudinal valley in which the sources of the Elbe gather. Micaschists compose the pyramid of the Schneekoppe (5260 feet high), which rests upon a granite base.

On the east the primitive rocks of the Riesen Gebirge disappear beneath the ridges of the Waldenburg coal basin, which is dominated by steep porphyritic mountains. At the opening at Landeshut (1770 feet), which is the most direct link between Breslau and Prague, the coal measures of this basin pass over into Bohemia. Not until they reach the foot of the Heuscheuer Gebirge do they disappear beneath the freestone formation, which extending from Bohemia into Silesia, defines, with the rocks of Adersbach, the high central pan of the Waldenburg basin. From this a saddle leads over towards the south-east into the deep hollow of Glatz, which is so shut in by mighty masses of primitive rock that its waters, collected by the Neisse, are only able to escape northwards to the Silesian plain through a deeply cut gorge. While, like the Riesen Gebirge, the primitive ridges on the north and south-west of the county of Glatz strike towards the south-east, the gneiss and old schists of the Schneeberg beyond Glatz, where the basins of the Baltic, the North, and the Black Seas meet, run towards the south-west. A south-westerly grain also prevails among the rocks of the Altvater Gebirge and the adjoining plateau on the border of Moravia, which is intersected by remote meandering valleys. The transition to the eastern limit of Bohemia, which is the lowest of her borders, is thus prepared in the eastern wing of the Sudetic mountains. Between the granitic heights lie easy openings for traffic between Bohemia and Moravia. The basin of the March interposes an independent formation, resembling the foreland of the Alps, between the ancient masses of Central Germany and the folded ranges in southern Central Europe. The Moravian Gate between the Sudetic mountains and the Carpathians (hardly 1000 feet high) is the lowest of the passages between the Danube and the Silesian plain, from which islands of old rock still rise to considerable heights.

THE TABLELANDS OF CENTRAL AND SOUTH GERMANY—THURINGIA, HESSE, FRANCONIA, AND SWABIA.

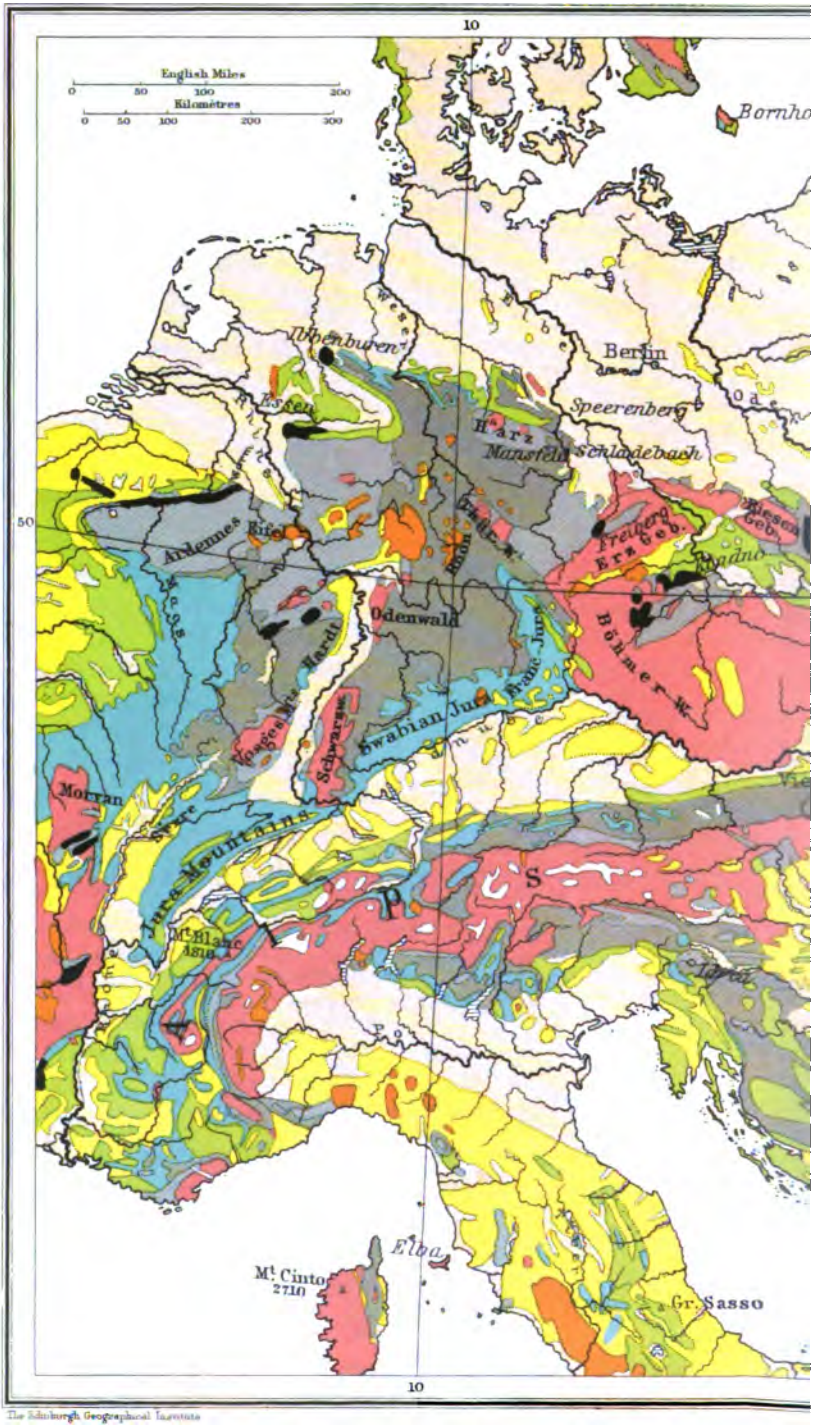
Opposite to the Bohemian group stand the mountains of the Upper and Lower Rhine, independent masses of very old rock. If with the latter we include not only the closely connected Ardennes, but also the structurally related Hartz Mountains, lying like a severed island at some distance, we shall at once perceive the bounds of the triangular territory of Central and South-Western Germany, whose features present not a few points of structural and correlated unity. The Saale and the Upper Weser, the Main, and the Neckar, main watercourses around which lie the habitations of four German tribes, all flow through winding valleys cut into tablelands of sedimentary rock. These tablelands are closely connected, for their continuity is only interrupted by the promontory of older mountains which runs, under the names of the Franconian and the Thuringian Forests, north-westward from the Fichtel Gebirge to Eisenach. This promontory is a long, narrow range, a strip of raised land, between depressions on either side. The Triassic deposits which once clothed its surface have been worn away and the older foundations laid bare.

The country overlooked by these heights presents, from the Thuringian Forest to the Hartz Mountains, the outward features of a plateau; to the geologist it is a trough filled by the three members of the Triassic group, concentrically disposed in close conjunction and intersected by many lines of fracture. The wooded outer border is formed by variegated sandstone; the next belt contains a table of shell limestone, ill watered, but occupied by agriculture; the centre, which is the garden country of Erfurt, is a shallow basin of red marls. Into the strata of these rocks the Saale and its tributaries cut their valleys. Their unsteady direction contrasts strangely with the straightness of a valley in the northern neighbourhood. The valley of the Leine at Göttingen, which runs in the direction of the meridian, marks a long rift in the most northerly of these great slabs of Triassic sandstone which, under varying names, prevail throughout the district of the Upper Weser from the Solling to the Rhön, and even farther to the Spessart. The Hessian mountain district, however, appears clearly differentiated from the wider spread area of the Triassic sandstone by the unusual development of recent volcanic rocks. Germany nowhere possesses any other accumulation of basalt comparable with the flat cone of the Vogelsberg, which rises in long slopes from a base thirty miles in diameter. In the High Rhön also a base of Triassic sandstone is crowned by a ridge of basalt; the poor, treeless mountains here divide Hesse and Franconia.

If, taking the direction opposed to the flow of the water, we follow up the Main from Aschaffenburg, or the Neckar from Heidelberg, and approach the region of their sources, the varying nature of the river bank will show us the geological formations of Franconia and Swabia in regular succession from the wooded Triassic sandstone mountains of the Spessart and the Odenwald, through the fertile plains and the sloping vineyards of the shell limestone, to the gentle hills of red marl. Ultimately we stand in front of the escarpment of the jurassic limestone.

The Jura chain, from the Falls of the Rhine to the junction of the sources of the Main, is the largest limestone range of inner Germany. While it slopes gently

CENTRAL EU


English Miles
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Weser
Elbe
Berlin
Speerenberg
Od
Harz
Mansfeld
Schladebach
Freiberg
Erz Geb.
Riesen Geb.
Kladno
Ardennes
Eifel
Meuse
Hardt
Odenwald
Thür. W.
Rhön
Böhmer W.
Franc. Jura
Swabian Jura
Donau
Vosges Mts
Schwarzw.
Morvan
Saône
Jura Mountains
A L P S
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Idria
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Elba
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Gr. Sasso

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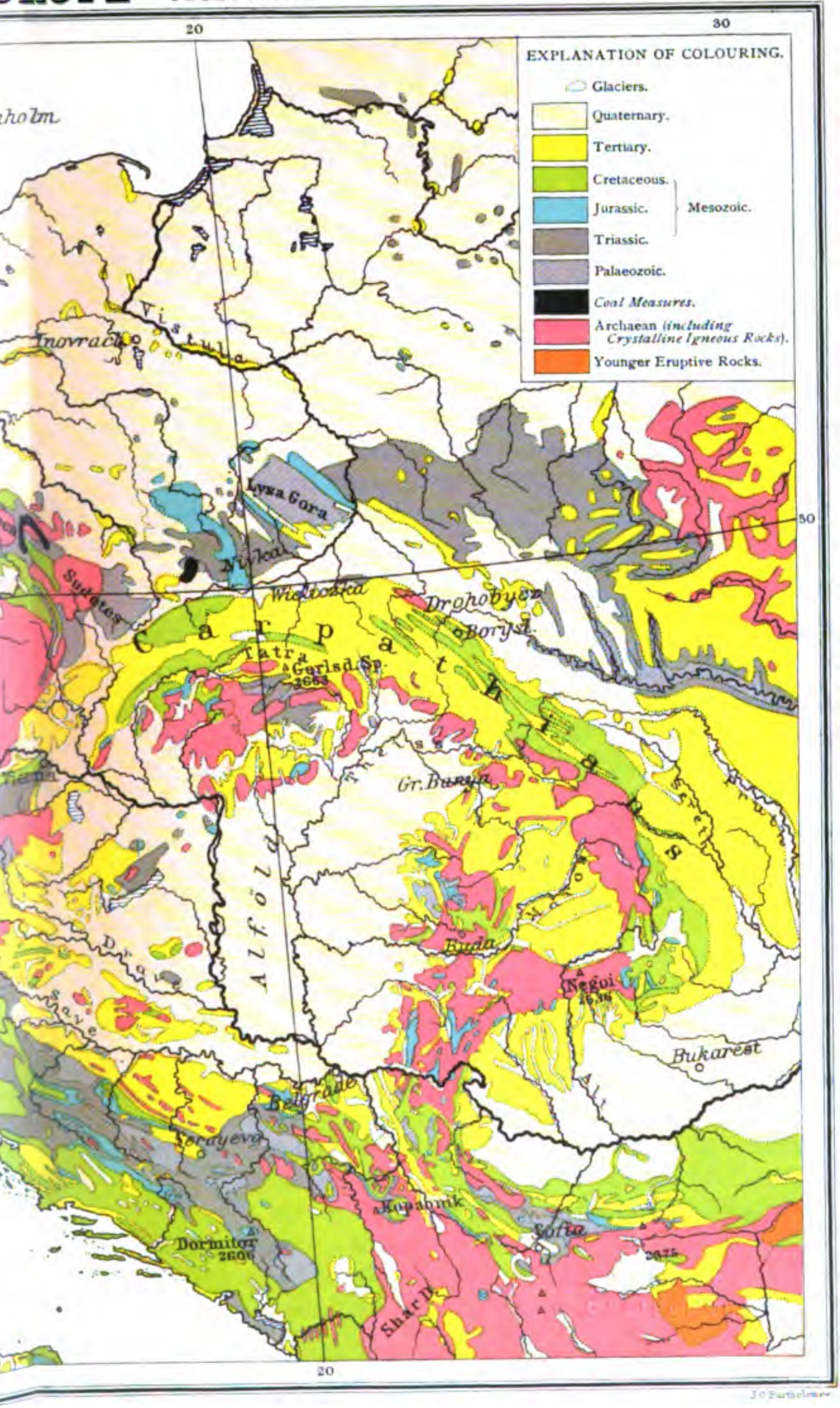
UROPE – GEOLOGICAL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30
EXPLANATION OF COLOURING.
Glaciers.
Quaternary.
Tertiary.
Cretaceous.
Jurassic.
Mesozoic.
Triassic.
Palaeozoic.
Coal Measures.
Archaean (including Crystalline Igneous Rocks).
Younger Eruptive Rocks.
holm
Vistula
Inovraclo
Lysa Gora
Nykal
Sudetes
Wieliczka
Drohobycz
Borysl.
Carpathians
Tatra
Gerlsd.Sp.
2663
Theiss
Gr.Banya
Alföld
Sereth
Pruth
Maros
Ruda
Negoi
Drave
Save
Belgrade
Serayevo
Bukarest
Alt
Kopaonik
Sofia
2675
Dormitor
2606
Shar D.
50
20

J G Bartholomew

towards the Naab and Danube, it breaks off sharply with a marked escarpment on the inner side of its curve, where appear the older deposits. The whole chain forms two wings, separated by the valley of the Ries at Nördlingen, a depression which has volcanic rock emerging from its lines of fracture, and the Wörnitz flowing through it. Here the road from Augsburg to Nuremberg finds an easy passage open from the Wörnitz to the Regnitz, which latter river flows northward through a sandy plain full of fir woods. It reaches the Main among the fruitful gardens and below the sloping hop plantations of Bamberg.

Eastward of this busy valley-road rises the Franconian Jura, the northern part of which, though only of moderate height, offers to lovers of the picturesque curious caverns and beautiful formations. At the point where the curve of the Franconian Jura turns from the south towards the south-west the mountains drop to a pass 1380 feet high, which is crossed by the Ludovic Canal, connecting the Regnitz and the Altmühl, Bamberg and Kelheim. At the end of this connection the Danube lies 370 feet higher than the Main. The difference of height is even more marked in the Swabian Jura, where Ulm and Sigmaringen on the Danube lie 800 feet above the corresponding cities of the Neckar, although the highest crest of the mountain is from 13 to 19 miles away from the Danube, and scarcely half so far from the valley of the Neckar. The steep northern face is cleft by deep ravines between which precipitous tables of rock, separated from the main body of the mountain, rise in peninsulas and even islands, fit for the site of medieval castles.

In addition to the striking formations usually characteristic of limestone mountains, the caverns, hidden waters and amazingly abundant springs, the Swabian Jura has many outbreaks of volcanic rock, which in some places have only become exposed through the action of denudation, but now, on account of their hardness, overtop the hills of the neighbourhood. The real glories of the landscape, however, are the Tertiary volcanoes in the area of depression at Hegau, to the north-west of the Lake of Constance;

the Hohentwiel, upon whose summit the glaciers of the Alps unloaded their stony freight, has even more wonderful tales to tell to the student of nature than to the poet by whom its historic memories are awakened to new and glorified life.

The low plain of the Upper Rhine, from Basle to Mainz, is a typical example of a long-drawn rift valley. Beneath it lie buried the central heights of a mountain range. The Vosges and the Black Forest are remnants of this range, much worn away by later atmospheric action, and their steep slopes towards the depression, as well as their gentler outer slopes, show distinct traces, both in contour and internal framework, of their original connection. In comparing these two mountain sections, however, we must bear in mind that the eastern wing always lies rather more to the north, because the grain of the old mountains, which were cut in two by the trench of the Upper Rhine valley, ran north-eastward.

THE MOUNTAINS AND LOWLAND OF THE UPPER RHINE.

Easy roads go round both groups of mountains on the south ; the Rhine valley above Basle makes an opening through the Jura, while to the west lies a widely open pass 1150 feet high, the Burgundy Gate—the "trouée de Belfort"—over which canal-boats float from the Rhine to the Doubs and the Rhone. On the immediate borders of these easily passable valleys both the massifs lift their loftiest summits, peaks of gneiss and granite from 4500 to 4900 feet high. But even south of the latitude of Strassburg the primitive rocks disappear beneath a bed of variegated sandstone, which creeping up the slopes of either range, from Lorraine and from Swabia, gradually covers them to the summit, imparting to the northern parts of both groups forms that are flatter, and along the edges of valleys more abrupt.

To the north of the Vosges is the Pass of Saverne, 1325 feet high, beneath which the Rhine and Marne Canal is carried through a tunnel. To this corresponds, on the right bank of the Rhine, a little more to the north, the low hilly country which offers to the traffic between Karlsruhe and Swabia the choice of so many roads. As might be expected the Neckar seeks a passage to the Rhine across this hill country.

In the Odenwald the mountains of the Upper Rhine once more rise to considerable altitudes. The fractured western slope, adorned by the vineyards and fruit gardens of the "Bergstrasse," cuts through a group of old granites, but the eastern part of the range is formed by the flat ridges of the sandstone, on which, like a button on a cap, is set the basaltic top of the Katzenbuckel. In the Bavarian Palatinate, opposite to the Odenwald, the Hardt mountains form the last link of the western mountains of the Upper Rhine. These, as their name shows, and as would be expected from the sandstone composition of their heights, are a woodland of great extent, bordered along the eastern slopes by splendid vineyards. The north-western boundary of this mountain country is formed by the great main road of the Palatinate from Kaiserslautern to Zweibrücken, along which so many armies have passed between Mainz and Metz.

The remarkable symmetry of the mountains on the two sides of the Upper Rhine extends to their forelands. Lorraine, like Swabia, is a graduated terraced district, the outlines of which are marked by the edges of formations following in regular succession one on another. Different reaches of the northward rivers Saar, Nied, and Moselle follow the scarps of the various deposits, none of which, however, assumes so conspicuous an importance in the landscape as does the Swabian Jura. The hills of Metz to the right and left of the Moselle belong to two different steps in the successive formations; the table mountains of the left bank, which carry the higher forts, mark the escarpment of the middle stage of the Jura. Their strata are the same as those which contain the rich iron ore of Lorraine and Luxemburg.

Thanks to its position, to the manner in which it is enclosed, and to the slight elevation above the sea (between Basle and Mainz from 900 feet to 260 feet), the low plain of the Upper Rhine, twenty miles wide and nearly two hundred miles long, is the warmest and most cheerful valley in Germany. The highest degree of fertility is exhibited by the loess deposits, with their covering of orchards and vineyards, clothing the hills at the foot of the mountains.

The oldest Rhine deposits of rubble, which not far from Bingen lie 500 feet above the level of the river, are to be found at Mainz only, far below the plane of the valley's surface, and possibly below the level of the sea. In spite of having suffered this great tilt of its original bed, the Rhine has maintained its place. The crisis in the river's history has, however, left its imperishable marks in the highly varied character of the banks, in the deep gorge below Bingen, and the flat surface of the thick bed of gravels above that place; and the rapids of Bingen remain its eloquent memorial. The fall of the Rhine, which here suddenly increases to ten feet in a mile, is very slight between Mainz and Bingen, only 0.8 inches in a mile. Between the vine-clad slopes of the Rheingau the river flows broad (700 to 800 yards) and majestic, curving but little and occasionally divided by long fish-shaped islands. The gentlest slope, however, of its bed lies above Mainz. At Oppenheim ends a reach of the Upper Rhine which exhibited, before the regulating works of the present century, a tangle of wide and ever-changing curves, that now approached the right and now the left bank of the wide valley.

The course of the river in its Baden reach has been shortened by fifty miles—that is to say, by 23 per cent. of its former length—and its waters have been, as far as possible, collected into one channel firmly walled in by dikes, while the mere increase in the fall has enabled this channel to cut itself deeper into the bed of the valley. Navigation has thereby been the gainer. Up to Mannheim there is now an assured depth of 6 feet 5 inches, and up to Strassburg of 5 feet. The Main is canalised upward as far as Frankfurt, and navigable for ships of 1000 tons. Mannheim and Frankfurt are thus centres of the great inland water traffic of South Germany.

THE MOUNTAINS OF THE LOWER RHINE AND THE ARDENNES.

If we go down the Rhine from Bingen, the boat, after gliding beneath the sunny slopes of Rūdesheim, enters an overshadowed rocky ravine, which at the rock of the Lorelei narrows to 180 yards, but at the same time compels the river to deepen its bed to 90 feet. The waters are enclosed between steep walls and divided by rocky crags and islands. Castles stand in the midst of the stream or high above it on projecting rocks. Picturesque spots nestle in nooks of the bank, or form a belt along its narrow border. At times the valley opens to cheerful basins. That of Coblentz receives the junctions of the Lahn and the Moselle, which emerge from narrow winding valleys. Once more, however, the Rhine valley closes in and narrows. It is not until the Sieben-Gebirge, near Bonn, that the hills begin to recede and the bay of the Cologne lowland opens. The encroachment of this diminishes the breadth of the mountains between Bingen and Bonn to sixty miles; between Wiesbaden and Dortmund, and between Saarbrücken and Liège, the breadth is twice as great.

Thick population and noisy industrial life fills the valleys of the Saar, Ruhr, Meuse, and Sambre, which cut into the coalfields. In sharp contrast with the active life reigning here, as well as amid the busy traffic of the Rhine Valley and the towns and gardens along the Main, is the silence of the sparsely peopled highland that stretches between the valleys. Although their elevation on either side of the Rhine is on an average less than 2000 feet, the undulating high-plains of Eifel and Westerwald are subject to a raw and rainy climate. The Eifel and Westerwald would be the most monotonous uplands of Germany, if it were not for the peculiar charm imparted to them by volcanic forms. The Eifel is the only district of Germany in which volcanoes exist similar to those of Auvergne, although much smaller. They are of so recent a date that the structure of their craters and the course of their lava streams remain in good preservation and are easy of study. Essentially different from the craters are the funnels of explosion, whose hollows are filled by round lakes—the Maars. The most considerable of these, the Lake of Laach, is a very gem of beauty, but it needs to be sought out. The trachytic peaks of the Sieben-Gebirge, on the contrary, which adorn the horizon of Bonn, stand close to the Rhine.[1]

The Ardennes are the immediate continuation of the Lower Rhenish mountains. The character of the landscape, however, softens towards the west. Amid diminishing heights the valley in which the Meuse cuts across the highland between Mezières and Namur, is in its conformation a complete but tamer counterpart of the Rhine valley. As the elevation of the wooded range grows smaller, so also does its breadth. Only on its northern edge, marked approximately by the Meuse and Sambre line through Liège, Namur, and Charleroi, and farther on by the valley of Hainault, does the range follow the south-western direction conspicuous in its German portion. Its southern border, the outline of which is plainly traceable along the reach of the Meuse between Sedan and Mezières, and along the continuation of this line on either hand through the valleys of the Chiers and the Sormonne, turns so distinctly towards the north-west that the two borders plainly converge upon Valenciennes. In this direction the Ardennes run out to a point. Their southern border has been secured by France, and along the Meuse a tongue of French territory penetrates deep into the Ardennes to the fortress of Givet, the key of the Meuse valley. The softly undulating hill country north of the Sambre and Meuse, in the depth of which lie further thick coal-beds, forms a gradual transition from the Ardennes to the low-lying foreland, and from Upper Belgium to the Netherlands.

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[1] The abundance of mineral springs characteristic of this volcanic region recurs more markedly on both slopes of the Taunus; the summits, however, of this chain are not of volcanic origin, but owe their altitude, approaching 3000 feet, to the hardness of quartzites withstanding atmospheric destruction.

THE HARTZ AND THE MOUNTAINS OF THE WESER.

Near the parting between the basins of the Rhine and the Weser, the ancient formations of the Lower Rhenish mountains, steeply raised and running to the north-east, disappear beneath the flat plateau of the Hesse mountain country; but sixty miles to the east, on the parting between the basins of the Weser and the Elbe, they come to light again in the mighty block of the Hartz mountains. Here, too, their strata strike north-eastward, and their high pressed folds have lost their peaks, and only the torso, a mass with shallow domed summits, remains. In the Hartz, however, the whole width of the base is not upstanding, but only a fragment bounded by lines of fracture. Along its length from south-east to north-west the height of the group rises gradually from 1000 to 2000 feet. Thus the Lower Hartz, which is already to a great extent denuded of woods and given over to agriculture, differs from the thickly wooded Upper Hartz district. In both parts great masses of granite and porphyry rise high out of the sedimentary rock, the bare Brocken to a height of 3746 feet.

Peculiar charm is imparted by the old mining works of the uplands, the deep shafts of which went lower than the sea-level. The hill country about Mansfeld also, the south-eastern end of the Hartz mountains, which is rich in copper and silver, is enlivened by mining operations. Although the Hartz range forms a lofty island overtopping its environment, the country around is by no means monotonous. It is dominated by a number of short and narrow lines of hill divided by lower lying stretches and following the same north-western direction as the northern line of fracture of the Hartz mountains. Thus the country north of these mountains is filled to a distance of thirty-five miles by a whole swarm of these mountain fragments, which, whether covered with leafy wood or bearing the ruins of castles, animate the landscape by a succession of changing pictures. This conformation of the country is interrupted by an inlet of the lowland at Brunswick, but directly west of this it begins again on both sides of the Leine, and here attains a considerable breadth. Beyond this river, whose valley opens a most important communication between Central and North Germany to the west of the Hartz mountains, rise to 1300 feet the two parallel ridges of the Deister and the Süntel, which are of importance to their neighbour, Hanover, because they supply it not only with excellent sandstone for building, but also for purposes of manufacture with good coal from the Cretaceous formations. The southern slope of the Süntel adjoins the Weser just after this river has cut its way through the most northerly of the Triassic slabs that stretch northward from Hesse. The river here follows the southern foot of the hills for twenty miles before traversing in the famous Westphalian Gate at Minden. Westward of the Weser the range continues for forty miles. Parallel with it on the south-west, beyond the long hollow of Osnabrück, runs the Teutoburger Wald, with elevations equally gentle, and an extent even longer. Between this and the northern border of the Lower Rhenish highland lies the country in which the Lippe and Ems originate—the inlet of the Munster lowland. Its eastern angle at Paderborn is shut in by the Egge Mountain, which running southward, links together the two chains.

Note on Authorities.—Only one volume, *West und Süd-Deutschland*, has yet appeared of Richard Lepsius's colossal work, *Geologie von Deutschland und den Angrenzenden Ländern*, 1887–1892. Most of the sheets of his geological map of the German Empire are therefore without any explanatory text such as F. von Hauer has supplied in a short space to all the eleven sheets of his general geological map of Austria-Hungary.

A literary guide through the rich special literature is presented by K. Keilhack and E. Zimmermann (*Abhandlungen der Königlichen Preussischen Geologischen Landesanstalt.—Neue Folge*, xiv., 1893, xxvi., 1897).

CHAPTER VII

THE NORTH GERMAN LOWLAND AND THE GERMAN SEAS

IN more than one place the boundary of the mountains of Central Germany resembles a coast-line rich in islands. Even at a considerable distance heights of firm rock lift up their bold heads out of the loose diluvial land. Most of them fare but ill; human labour is swift to attack them. The limestone mountains of Rüdersdorf, to the east of Berlin, are being so quickly quarried that deep hollows are already yawning where hills once stood. The proud chalk cliffs of Rügen, however, still shine out to sea, and the fretting waves still toss round the rock of Heligoland. In other parts, the deepest borings of the world have dived beneath the flat and uniform upper surface into the fundamental rock, and there reached its treasures of salt, gypsum, and coal. On the whole, however, our knowledge of the outline and composition of these deeper rocks is but fragmentary.

The filling up of their hollows and the levelling of their surfaces was begun even in the Tertiary period; partly by the seas which entered through the Moravian gap into Upper Silesia and Galicia, and in the north only gradually abandoned Northern Germany; partly by deposits that took shape on the new mainland, in whose lakes and swamps the products of a luxuriant vegetation formed those beds of lignite which exist below the bays of the Silesian and Saxon lowland, and on the surface of the Mark, no less than in the Bohemian basin and the Alpine foreland. These Tertiary formations, however, were subjected to the destructive catastrophe of the Glacial Period, which dislocated their strata, and buried them under new formations, thus exercising a long-enduring influence on the surface of the country.

The whole North German plain shows traces of a considerable movement of rocks to the southward. Behind every upstanding pillar of basalt, on its southern side, lies a space covered with scattered blocks, among which mingle some derived from Scandinavia, Finland, and the Baltic Islands, the proportion of these increasing as we go northward. Geologists have recognised that this change of place cannot have been effected by icebergs floating upon the seas that overspread the plain, but that the glaciers of the Scandinavian highland pushed forward their masses of ice into Germany, and there produced upon the land those effects which only glacier masses can produce. The boulder clay, formed as a ground moraine moving forward beneath a weight of ice, is interspersed throughout with great and little stones that have neither order nor stratification, their surface being often characteristically polished and scratched. Even blocks of immense size were carried down by the slow stream of ice, which on the mountains of Central Germany sometimes reached as high as 1500 or even 2000 feet. Its border followed the edge of these mountains from Duisburg to the Moravian gap, and also that of the Carpathians as far as Sambor. It also penetrated far into the interior of the mountains near the Thuringian Forest, as far as Gotha and Saalfeld, and along the Elbe as far as Schandau, as well as deep into secluded valleys of the Sudetic Mountains. The most evident effect left upon the landscape by this great spread of northern ice, is probably the complete levelling of extensive tracts sheathed by the clay of the ground moraines. The fruitful fields south of Breslau and north of Leipzig were thus produced. But we shall seek in vain along the southern limits of the northern diluvium for typical terminal moraines. If they ever existed, they have long ago been destroyed again. It is only in a more northern portion of Germany that raised morainic formations still persist in the scenery. This region

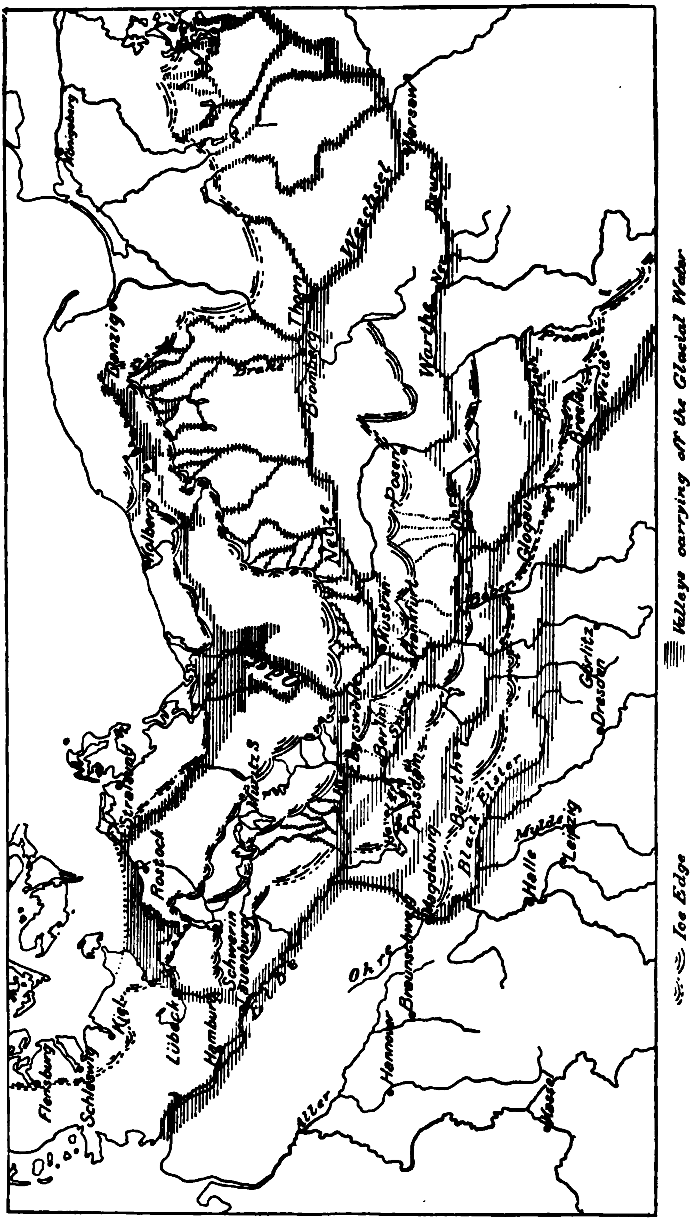

Königsberg
Danzig
Thorn
Bromberg
Weichsel
Warschau
Bug
Brahe
Warthe
Netze
Posen
Obra
Glogau
Bartsch
Prosna
Breslau
Weide
Kolberg
Oder
Küstrin
Frankfurt
Eberswalde
Berlin
Spree
Potsdam
Havel
Baruth
Black Elster
Bober
Görlitz
Dresden
Stralsund
Rostock
Müritz
Schwerin
Lauenburg
Elbe
Magdeburg
Mulde
Halle
Leipzig
Ohre
Braunschweig
Hannover
Aller
Kassel
Lübeck
Hamburg
Kiel
Schleswig
Flensburg
Ice Edge
Valleys carrying off the Glacial Water

FIG. 16.—Successive Edges of the Ice Sheet in the Last Glacial Epoch. (After Keilhack.)

experienced a second invasion of ice, proceeding as before from Scandinavia, which overpowered the German Baltic provinces, but did not progress very far towards the south. It would seem at times to have crossed the southern ridges in Silesia and the Mark, but never the Elbe. The retreating steps of this second incursion of ice appear to be marked by broad, eroded valleys worn out by the swelling waters into which the ice dissolved.

This second glacial period seems to have lasted specially long in the Baltic provinces of Germany, on the summit of the Baltic ridge. Many places along the southern border of this ridge, and considerable expanses of its surface, have been formed by curved rows of great terminal moraines. One direct consequence of the irregular outline of surface left behind by the later ice period is the abundance of lakes existing on the Baltic heights.

The circumstance that the latest, and as far as the conformation of the country is concerned, the most important manifestations of the Glacial Period, came from the Baltic Sea, and shaped around it concentric zones of morainic formations, leads us to start from this sea in considering the North German Lowland. Around its waters lies the Baltic Ridge. From this we descend southwards into the zone of great valleys (Warsaw, Berlin, Hamburg) which narrows towards the west. On the southern border of this rises a second inland row of hill ranges. From these the prospect extends over the wide valley basins of the Silesian Oder, the Saxon Elbe, and the Hanoverian Aller to the front of the mountains whose spurs press forward between these three valleys. Thus it may be observed that the north-western ends of four zones of North German country approach the North Sea. They do not, however, carry their natural contrasts in full force up to that sea, for its coast is bordered by a lowland that extends in increasing breadth from Schleswig to the Netherlands, and of this the dunes, marshes, and moors constitute a separate natural division.

THE GERMAN BALTIC.

The Baltic is a sea of recent origin. It is the most sunken portion of the great flat tract between the Scandinavian Mountains and Central Europe. The sinkings by which the hollows of its basin were fashioned continued through the interval between the two Glacial Periods. Even when the Ice-Age was over, the shore of the basin underwent variations of level which have repeatedly altered the manner of its connection with the ocean. The Swedish lakes mark the place of an old Baltic outlet; and when this gap closed, the Baltic became an inland sea, whose surplus waters escaped through a river that may be compared with the Neva. The position of this outflow seems to have changed, for the sinking of the ridge of land between Jutland and Sweden submerged several eroded channels which are now arms of the sea. Thus arose the Sound and the Belts.

The shallowness of these arms limits the free exchange of water with the ocean, and diminishes the saltness of the surface water, so that at Alsen the Baltic is less salt than the ocean by one-fifth, and at Dantzig by one-half, and this enclosed basin is consequently more easily affected by the frosts of the neighbouring climates and its navigation is liable to be interrupted every winter. The interruption lasts longest in the northern and eastern portions of the Baltic; the central basin suffers comparatively little. Libau remains free from ice in most winters, but the harbours on the Baltic coast of Germany enjoy by no means the advantages in this respect which might be expected from their southern position. They lie some distance from the open coast, at the head of inlets with enclosed waters or river mouths, and are closed to navigation for appreciable periods. The average duration of the ice-block in the open sea at Memel is twelve days, at Swinemunde twenty, and at Travemünde twelve; while the inner harbour of Memel remains closed on an average for 142 days, that of Neufahrwasser near Dantzig for eighty-one, Stettin for sixty-one, the Greifswalder Bodden for fifty-eight, and Lübeck for thirty-two days. These variations are in great measure due to the conformation of the coast.

The slanting waves that strike the coast of Eastern Pomerania and Russia form deposits of boulders and sand, and the constant recurrence of waves running in the same direction gradually pushes these towards the north-east, and builds up curving strips of sand which extend like a loosely hanging chain from one projecting point to another. Becoming gradually heightened and strengthened by the accumulation of dunes, they cut off shallow pools from the open sea, and the rivers of the country convert these pools into fresh-water lakes with greater or less completeness, according to the degree in which they are cut off from communication with the waters of the sea. Thus arise the "haffs" or fresh-water lakes lying behind the "nehrungs" or bars of land whose coherence is occasionally broken by an inlet—a "deep."

The type of the "haff" coast is most fully developed in East Prussia. The high projection of the Samland cape, which is rich in amber, makes a firm link between the two retreating "nehrungs," neither of which rejoins the main-coast for sixty miles, the Kurische Nehrung doing so to the north of the Memel, and the Frische Nehrung, continued by the dune that borders the delta of the Vistula, at Zoppot. These two bars are only broken at their northern ends, at Memel and Pillau, by "deeps" which open a highway for ships to the mouths of the Niemen and the Pregel. The "haffs" behind have already suffered considerable diminution; the Kurische Haff owing to the formation of the delta of the Niemen, which consists of great marshes, and the Frische Haff to a slight extent owing to the alluvial deposits of the Pregel, and to a great extent because of the fruitful richly cultivated lowland with which the Vistula has completely filled its broad western end.

The Vistula sends but two branches into the Frische Haff, while the main river reaches the sand dunes by the sea near Dantzig, at the foot of the hill country rising on the west from its lowland. The point at which it breaks through the sand-hills has changed even in the nineteenth century. The western portion of the great gulf of Dantzig is sheltered from the open sea by the peninsula of Hela, twenty miles long. With this begins the monotonous flat coast that bounds East Pomerania, a shore with numerous border lakes lying behind it.

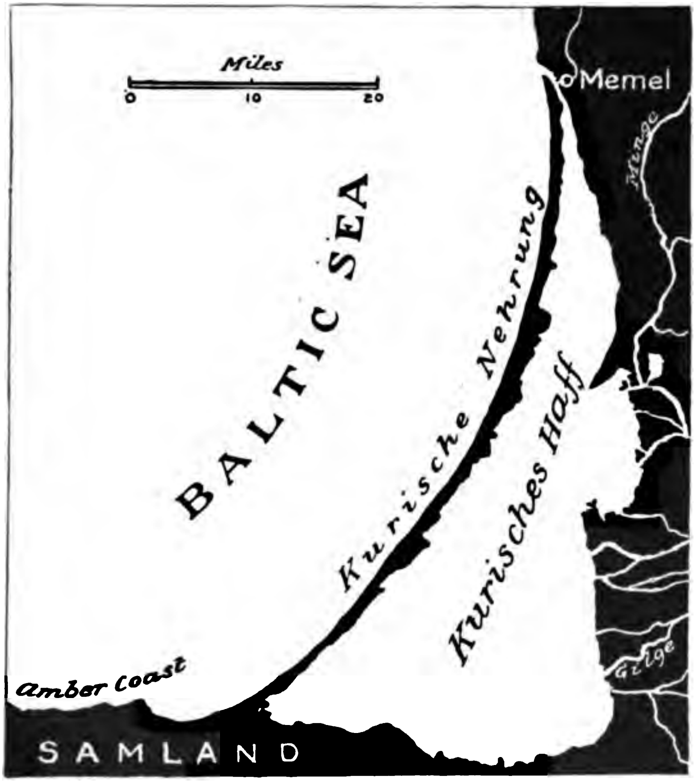

Miles
0
10
20
Memel
Minge
BALTIC SEA
Kurische Nehrung
Kurisches Haff
Gilge
Amber Coast
SAMLAND

FIG. 17.—A Prussian Haff.

The great fresh-water basin at the mouth of the Oder also bears the name of a Haff. But the division of this from the open sea is not effected by a sandy "nehrung," but by the islands of Wollin and Usedom.

The " boddens " which occur along the coast are eccentrically branched shallow bays, the outlines of which have been determined sometimes by the accidental shapes of half-submerged blocks of diluvial or older rock, and sometimes by later action of the sea, either in the form of a destroying invasion of its waves, or more often by new marine formations which have sought to connect a chain of islands, and have succeeded to a greater or less extent in that aim. The complex coast-line of the island of Rügen is the classic example. Narrow, gently curving sandbanks link together some old cores of undulating diluvial land around the old high-island of Jasmund (527 feet high), beneath whose crown of beech trees shine the white chalk cliffs of Stubben Kammer, forming a beautiful landmark from the distant German shore. Arcona, at

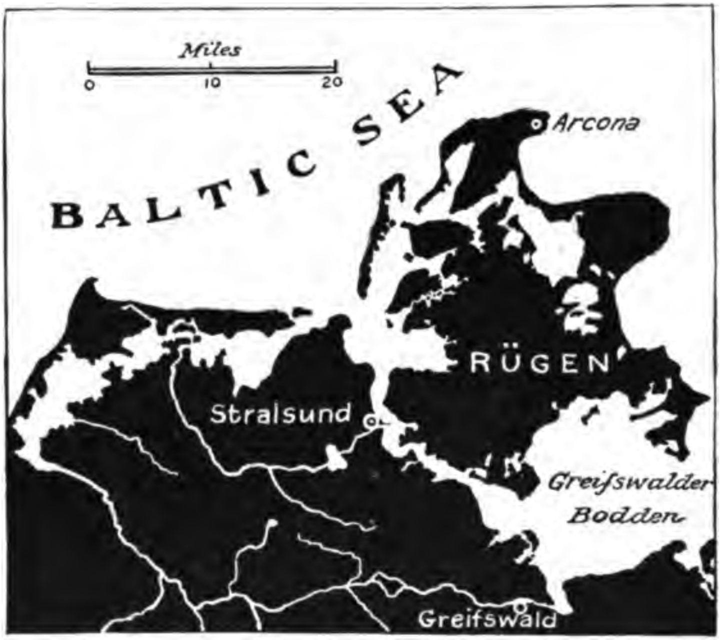


FIG. 18.—The Boddens of Pomerania.

the north-eastern point of Rügen, needs a cable only fifty miles in length to connect it with Scania; and the most westerly of the islets is but thirty-five miles from Möen, the nearest of the Danish islands, with which it is connected by a line of ten fathoms' depth. At this point we leave the open main basin of the Baltic, in which there are depths of as much as 234 fathoms, and enter the narrow, shallower waters of the Belts.

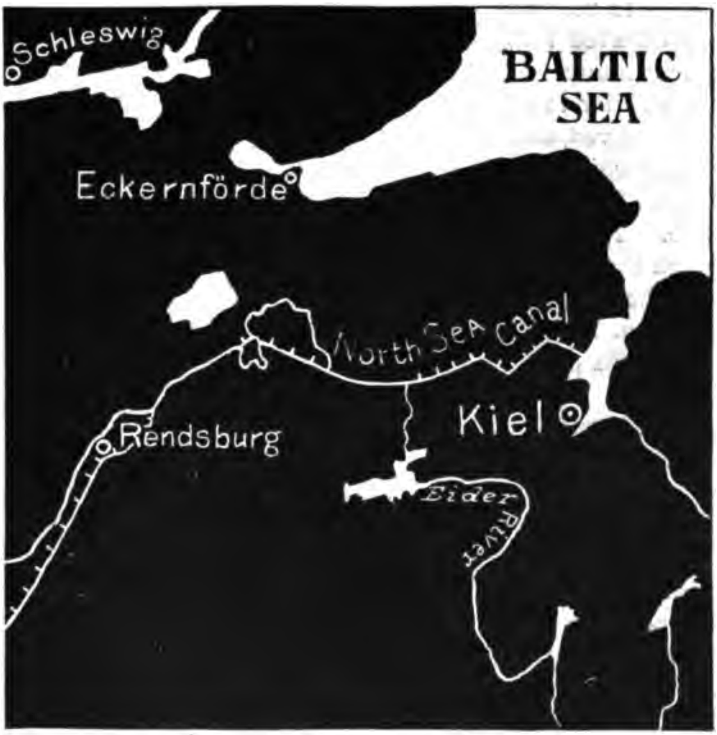

Schleswig
BALTIC SEA
Eckernförde
North Sea Canal
Kiel
Rendsburg
Eider River

Fig. 19.—The Förden of Holstein.

On the other side of the broad gulf of Neustadt, into the head of which the Trave flows, a third type of coast formation begins on the shores of Holstein: that of the "förden." These are inlets running at right angles to the course of the coast-line, and narrowing as they go up into the land: they are evidently submerged valleys. The most important of them, the inlet of Kiel, whose entrance narrows at Friedrichsort and so partly and advantageously encloses the inner recess, corresponds in a striking manner to the upper valley of the Eider. It appears, indeed, to be an abandoned valley of this river, which was only diverted into another course by the Glacial Epoch. The accumulation of the ground moraine barred the return of the Eider to its old valley, even when the barrier of ice was dissolved, and compelled it permanently to take another way, by which it was led into the North Sea. In like manner, moraine hills form the western close of the valley of Ekernförde. The "förden" of Schleswig-Holstein, for the very reason that they receive no rivers and no alluvial deposits, form the best natural harbours of the Baltic, whose coastal formation in other parts everywhere directs navigation to the mouths of the rivers.

THE BALTIC RIDGE OF LAND.

The connected belt of heights running round the southern basin of the Baltic from Courland to Schleswig is broken in three places by important rivers, the widest breach being at the north-eastern corner of the German Empire. All the north of East Prussia is a lowland, formed by the development of cross-connecting valleys, between the hollows of the Niemen and the Pregel. The Inster fills a channel that was once dug by an arm of the Niemen running into the Pregel, while on the other hand, the Deime, an arm of the Pregel, runs northward into the Kurische Haff. The plateau of Samland is surrounded by water on every side like an island.

To the south of the Pregel the land begins gradually to rise towards the Prussian ridge. Hundreds of lakes, some of them basins with many branches, some long narrow channels with several pieces of water following one another like beads on a string, lie scattered among the hills of Masuria. With their border of greenwood, rising from the loamy soil of the shore in a wide fir and pine region, they form scenes of which the beauty, if not winning, is powerful and stimulating. The most important of these lakes, Mauer and Spirding, cover more than forty square miles, and lie so nearly on the same level as many others adjacent, that with a very little assistance, they might be joined into a system of navigable waters from which existing outlets would run north and south to the Pregel and the Narew, the southern opening alone, however, being accessible to rafts. A more westerly group of lakes, from which the Drewenz flows south-westward to the Vistula, has a navigable outlet towards the north, to Elbing and the Frische Haff. The elevation of this lake country is but little less than the maximum height to which the Baltic ridge attains in the Thurmberg (1086 feet) near Dantzig, to west of the fertile Vistula valley. The varied outline, the abundance of water, and the fertility of its vicinity form a contrast with the poor and monotonous fir-woods of the Heath of Tuchel.

A system of lakes comparable with that of East Prussia does not appear again until we have crossed the Oder and arrived among the high ridges of Mecklenburg, to the north of that nobly developed belt of terminal moraines belonging to the second Glacial Period, which has been traced from Oderberg north-westward to Schwerin. The most and the largest of Mecklenburg's six hundred and fifty lakes, including the Lake of Müritz which has an area of fifty square miles, send their surplus waters into the Elbe.

The last stretch of the Baltic Ridge, in the Cimbrian Peninsula, has a northerly direction. The moraine formations and the territory of the fertile boulder clay fill the delightful eastern parts of Schleswig-Holstein. The lakes of Eutin and Plön show their dark levels amid the light green foliage of the beech woods, while the waters of the sea are brought by deep fiords far up into the cheerful hills. The centre of the country is occupied by a flat and uniform sandy heath, sloping towards the west. In this direction the plateau is dissected into broad tongues, and between these, small strips of fertile marshland penetrate from the shore some distance into the country. From the diluvial plain of Holstein rises, suddenly and surprisingly, a peak of old firm rock, the gypsum of Segeberg.

Modest as are the heights to which the Baltic Ridge attains, they have been sufficient to secure to the lands traversed by it a separate place in the course of German development, and often to divide their fortunes from those of the Hinterland.

THE ZONE OF GREAT VALLEYS.

The same processes of nature that shaped the Baltic Ridge have been active also in the southern adjacent territory between the two ridges. Here, too, appear the deposits of the second Glacial Period; fertile flats of boulder clay, wide sandy plains, erratic blocks lying singly, or in accumulated hills that may be followed up for many miles. The forms, however, of the landscape have been less decisively affected by their accumulation than by the destruction which occurred a little later. The streams of melting waters that poured upon the exposed land as soon as the masses of ice began to retreat, cut into its surface broad deep valleys, which in many parts have determined the courses of our existing, feebler rivers, and in other parts have considerably facilitated artificial connections between these rivers (Fig. 16). The surface of the country and the border-line of the ice at the different stages of its retreat gave a westerly direction to the melting waters in the eastern parts, while farther to the west, in the lower valley of the Elbe, this direction became north-westerly.

Among the many old valley courses two are to be distinguished as particularly important: the valley of Thorn and Eberswalde, and the main valley from Warsaw to Berlin. The former accompanies the southern edge of the Baltic Ridge from Lithuania to the confluence of the Havel, and receives in succession the following rivers:—the Bobr, the Narew, the Vistula, the Brahe, the Netze, the Warta, and the Oder (between Cüstrin and Oderberg).

The canals that connect this point with the Lower Havel have to wind their way through many glens which cannot have belonged to the bed of a gigantic river. Only at some period when the level of the valleys still lay considerably higher can the original Vistula have taken its course this way to the Elbe. Be this as it may, the western stretch of the main valley was the first to fall out of use, when the Oder began to make its way northward through the Pomeranian plateau to the Haff. The connection between the Oder and the Vistula, on the other hand, would appear to have ceased only after the valleys had been very deeply excavated. The summit level of the Bromberg Canal lies only 100 feet above the water of the Vistula, and the valley eroded at the southern foot of the ridge by this river continues westward, in undiminished width, between high banks, from the point at which the stream quitted it. The little river Brahe looks like a dwarf in it who has slipped into the armour of a giant.

Similar phenomena of diluvial origin occur in the main valley, which begins in the broad, open basin of Warsaw. From the Vistula it may be followed through the valley of its tributary, the Bzura, over a marshy valley-watershed at Lenczyce to the Ner, a tributary of the Warta. Thence a slight ascent of twenty-three feet from Moschin on the Warta leads to the Obra. The southern branch of this bifurcating river obtains access to the Oder, which at Fürstenberg, where begins the northward turn towards Frankfurt, lies only forty-three feet lower than the summit level of the canal to the Spree along the former valley of the Oder. On the other side of Berlin and Spandau, the marshy depression of the Havelland is a direct continuation to the Lower Havel of this old valley of the Oder.

Yet a third and more southerly similar main valley of the Diluvial Period may be traced in the Mark of Brandenburg; this is the valley of Baruth, whose eastern portion includes the Spreewald, with its innumerable watercourses, while its junction with the Elbe valley is marked by other swamps. If we attempt to trace the valley farther eastward to the Oder at Glogau and to the Bartsch, we come upon bars of land which seem less compatible with the continued action of a great river than with possible occasional overflows from a lake dammed back in one of these more easterly valleys.

Lateral connections between the three great valleys are formed by the Obra, the Oder, the Spree, the Havel, and other cross-valleys. The vegetation of the alder swamp proclaims the natural condition of this network of depressions which were important as boundaries of districts and formed serious barriers to communication. Many large portions of these valleys, previously neglected, were brought under cultivation only in the last century. The colonisation of the Oder swamp and of the lowland of the Warta and Netze valleys, the improvement of the natural waterways, and the opening of artificial ones were the memorable achievements of enlightened and energetic rulers. Wide areas of once barren country have been turned into productive, cultivated lands. In the valley of the Oder alone, between the two Ridges, dikes protect no less than 455 square miles, and in the Warta swamp, between Cüstrin and Schwerin, 140 square miles.

The Southern Ridge of Land and the Valleys at its Southern Base.

Before the geological formation of Russia was known, no scruple was felt in linking the Ridges of Germany, by the names of Uralo-Baltic and Uralo-Carpathian, with the farthest mountains of Russia. Neither of these ridges stands in any sort of relation to the Ural Mountains, nor has the southern of them the remotest connection with the Carpathians; it is not even in any way a continuation of the terraced country of Poland and Upper Silesia, from which its commencement is sharply divided by the marshy valley at Kempen, which runs from the Upper Weide to the Prosna. In height and unity the southern ridge is inferior to that of the Baltic. Its parts are separated by considerable gaps—the sandy heights in the south-eastern corner of Posen, the fruit-bearing hills of Northern Silesia, the dry Fläming south of the Mark, and the solitary Lüneburg Heath. The high undulating plateau of this last, between the Elbe and the Aller, contains a solitary Triassic outcrop, and is thus unlike the other hills, whose core is made of the Tertiary deposits carrying lignites. The limestone, gypsum, and salt springs of the Heath give some importance to the old town of Lüneburg. Triassic sandstone also composes the rock of Heligoland. Towards the south the inland portions of this ridge fall away into three very dissimilar valley districts. That of Silesia exhibits a fertile centre flanked right and left by sandy forests; that of Saxony is entirely composed of good soils, while the south-east of Hanover comprises extensive bogs. With all these differences there are signs of former hydrographic unity among these three districts, between which the mountains jut out northwards. Between the Oder and the Elbe, striking links of connection are formed by the long valley of the Black Elster and the swampy hollows of Lower Silesia. Still more closely, however, is the zone of great valleys recalled by the appearance of the most westerly of the German alder swamps—the Drömling—from which the Ohre flows to the Elbe and the Aller to the Weser. Nor will the commercial importance of the Drömling long remain inferior to that of the more easterly valley-watersheds, for here the projected midland canal will open a connection between the Weser and the Elbe. Thus navigation will soon be active in the hitherto silent valley of the Aller, as it has long been on the whole German course of the Elbe, and for some years past in the upper regions of the Oder as far as Kosel, the river port of Upper Silesia.

The basin of the Weser, in common with the more easterly rivers, has a very one-sided development, the left-hand portion being restricted, while the right extends far, and includes a widely spread tributary which at its mouth exerts a visible influence upon the direction of the main stream. The whole course of the Weser, however, from the Westphalian Gate to the mouth, is not, like that of the other rivers, overlooked by the margin of a ridge, but lies open in a lowland, which exhibits neither division of its surface by lines of hills, nor any other of the distinctive marks of the East German plain. The enlivening abundance of variously shaped lakes has here disappeared from the country. The only pieces of water remaining on either side of the Weser, the Steinhuder Meer and the Dümmer—extensively covered by marshy deposits from which great pieces occasionally break off and drift to and fro as floating islands—are entirely different from the East German diluvial lakes; they are but portions of that great chain of bogs belonging to the North Sea district, which begins west of the Lüneburg Heath, not far from the northern edge of the Weser mountains, and continuing in cheerless alternation with the dry and sandy flats of the "geest," occupies the interior of the North Sea lowland up to the Zuyder Zee. The nature of the country's surface is here not determined by its conformation, but almost entirely by the alternations of dry and damp stretches of land.

THE NORTH SEA AND ITS LOWLANDS.

The bogs are not confined to the hollows and depressions of the earth, and the majority of them are by no means standing waters filled up with vegetation; most of them have arisen on shallow sandy soil with some impermeable formation below, which sometimes consists of clayey strata, and sometimes of a solid stratum of bog iron ore, formed of sand cemented together by hydrates of iron. Upon the soil of such underlying deposits have grown generation after generation of bog-forming plants that rise into a " high-moor " shaped like a shallow watch-glass. Insufficiency of nourishment limits the flora of the upper levels to those frugal ericaceæ which live on dry sandy soils; poverty of wood is common both to the bogs and to the dry "geest." Wide areas of North-Western Germany thus come to have a monotonous, melancholy character of landscape. The unbounded horizon, however, produces an overwhelming impression like that of the vastness of the sea.

The largest bogs lie in Friesland, on both sides of the Ems. On its right the Leda cuts off the Aremberg Moor, which is 690 square miles in extent, from that of East Friesland, 274 square miles in extent; while on the left, along the border of the Netherlands extends the Bourtanger Moor, with an area of 530 square miles. Although hardly a fourth part of these belongs to Holland, yet the whole proportion of that country occupied by bogs is reckoned at 1766 square miles, nearly 14 per cent of its whole area. These boggy portions, however, are almost entirely confined to the three north-eastern provinces.

The moor-lands are in general sterile and thinly peopled. But the time has gone by in which their surface was utilised only as poor pasturage, while the efforts at cultivation were confined to a few spots which were burnt off, and among the ashes of which a little buckwheat grew, until the wretched soil was exhausted and left to lie idle. Excellent results have already been obtained from the more thorough methods of cultivation, which consist in removing the peat and ploughing in the subsoil, which is sometimes of extremely fertile alluvium. Along the canals, too, by which the bogs are drained, and of which the wide ramifications serve as highways for the conveyance of the peat and the intercourse of the settlers, have sprung up prosperous colonies in this once desolate country. In East Friesland, Papenburg is the most striking instance of this kind. Far more extensive, however, are the results obtained by such labours in the province of Groningen, where more than half the original bogs have been thus reclaimed and turned into plough-lands.

On a still greater scale, however, is the struggle between man and ungracious nature as seen in the marsh districts nearer to the coast, where lowlands of fertile silt deposited by the rivers of the country, or in many cases by the invading waters of the sea, lie behind the zone of sand-dunes that formerly made a completer border than at present along the shore of the North Sea. There was evidently a time when the whole coast from the north point of Jutland to Flanders was formed by a great barrier of dunes, the course of which, curved like a reversed letter *S*, was regular to monotony, and only left open a few outlets for the waters of the mainland. Of this great ancient belt of dunes, four divided fragments remain as portions of the main shore, and even these are not uninjured:—

(1) The dunes of Jutland, from the Skaw to Blavandshook.
(2) The dunes of the peninsula of Eiderstedt.
(3) The dunes of Holland, from Helder to the mouth of the Rhine.
(4) The dunes of Flanders, on the other side of the mouths of the Scheldt.

These, however, must not be considered as abiding and permanent formations. For not only the waters of the sea, but also the very sand itself takes part in the conflict of natural forces by which the coasts are shaped. The power of the wind, by which the dunes were accumulated, does not leave the sand at rest, but is constantly driving it onward over the ridge of the dune till whole hills are gradually displaced and begin to travel inland. A Roman edifice erected on the inner side of a dune has been known to be first covered up by sand-drifts and then, when the dune had passed over and beyond it, to reappear behind, only to be swallowed up soon after by the waves.

The whole border of the flat North Sea shore has certainly retreated considerably before the invasions of the sea within the last two thousand years. Much greater, however, have been the losses in the three great gaps which to-day divide the four banks of sand-dunes. When once the natural bulwark of the dunes was broken through, no efforts of the threatened inhabitants availed to protect the loose marsh country—which often rested on a foundation of still quaking bog—from the wild assaults of the waves. A natural sinking of the coast increased the danger, especially for those areas which now lie lower than the level of high tides; these, owing to the increasing difficulty of drainage, were threatened with inundation from the inland waters also. The combination of conditions so unfavourable led to catastrophes by which hundreds of square miles were swallowed up and many thousand human lives destroyed. The formation of the Zuyder Zee (1219–1287), of the Dollart (1277–1287), and the Jade Bay (1218–1511) were only the worst of those disasters which made the Middle Ages so momentous in the history of the North Sea coast. It was not until the sixteenth century that the laborious but effective reclamation of lost lands, by the embankment of "polders" regained from the sea, was deliberately and systematically undertaken. Holland, in particular, has pursued this course of peaceful conquest with brilliant success.

On the west coast of Schleswig the belt of marshes is but narrow, and at some points so completely destroyed that the dry "geest" comes close to the sea. The luxuriant meadows of Ditmarsh, the carefully cultivated lowlands of Kehdingen, Hadeln, and Wursten between the Elbe and the Weser, and of Butjadingen between the Weser and the Jade, are only sheltered by dikes. On the shore of Holstein, in the last century, territory has even been conquered from the sea, and some "polders" wrested from the dominion of the shoals; their broad expanse has now become the best bulwark of these coasts against the attack of enemies. The estuary of the Elbe is the part freest for navigation, but even here the shoals extend twenty miles into the sea from Cuxhaven. Half-way between that port and Heligoland lies the first of the lightships which point the mariner to navigable channels between shifting shallows, while the two lighthouses on the island of Neuwerk offer fixed points for his guidance and lead him on to the light at the promontory of Cuxhaven. The deep clear waters that at this point lie close to the shores of Hadeln carry him in a sweep across the estuary to the mouth of the Kaiser Wilhelm Canal at Brunsbüttel on the coast of Holstein. Safe as is navigation in clear weather amid this abundance of sea-marks, yet in a fog the services of a pilot thoroughly familiar with the locality are indispensable, and in war-time, when the lights were extinguished and the beacons removed, the approach of a foreign fleet to the mouth of the Elbe would be attended by very considerable hazard.

This is the case in even higher degree in regard to the Weser and the Jade Bay. In spite of all sea-marks, it is highly inadvisable to sail into the mouth of the Weser without the guidance of a pilot, because of the alterations in the shallows constantly being made by the tides. On the Jade, too, the station of Wilhelmshaven is only kept safely accessible for ironclads of considerable draught by a continual dredging of the channel.

The high tides beat with somewhat less violence upon the marshes of Friesland, for a girdle of islands, 150 miles long, with firm dunes, persists from Wangeroog to Texel. Yet both this girdle and the mainland behind have, within historical times, undergone a considerable process of destruction, especially at the estuary of the Ems. The last centuries, however, have seen the greatest losses on the Dollart and Lauvers Zee in a considerable measure regained.

It is now well ascertained that the great inland lake, distinctly divided from the sea, known to the Romans by the name of Flevo, was in the thirteenth century changed, by the destruction of the land barrier at its western shore, into a bay of the sea. The success attending the enterprise of Holland in draining large inland waters, such as the Haarlemer Meer (70 square miles in extent) and the Lake of Ij (23 square miles), has inspired the attempt to dry up the greater part of the Zuyder Zee. A mighty dike to the Island of Wieringen is to close the entrance of this inland sea. Four great "polders," west and east of the basin, are to be embanked step by step, and its area thus reduced from 1400 to 560 square miles. The labour of this great work, the cost of which is reckoned at 189 million gulden, or nearly 16 millions sterling, will receive a rich return in the reclamation of nearly 800 square miles of fertile cultivable land.

In all undertakings for the protection of the shore against the sea, especial difficulties are presented by the problem of how to drain the marshes that lie below the average height of high tide. This is the case with one-fourth of the whole surface of the Netherlands. The task has only been achieved by the formation of an exactly planned network of trenches extending over the entire lowland, and sometimes crossing one another at different levels, supplemented by a series of pump-works, generally employing wind power, where the water is raised from the hollows into the canals above.

Of the mighty volume of water belonging to the Rhine, the division of which begins soon after its entrance into Holland, only one-ninth is carried into the Zuyder Zee by the Yssel, and two-ninths to Rotterdam by the Lek, while six-ninths fall to the share of the Waal. Above Rotterdam the Lek receives a contribution from the Waal, and flows into the sea at the Hook of Holland under the name of the Maas, a name only to be explained by the reception into this estuary of a former arm of the river of that name which rises in France. This once existing connection was, perhaps, served by "de oude Maas," the name given to a northern branch of the Waal which runs towards the estuary of the Lek below Dordrecht. Soon after taking in the true Maas (Meuse) the Waal assumes the name of Merwede, and under that designation flows into the southern estuary of the Hollandsh Deep. To the same estuary will the Meuse itself, whose borders have occasionally suffered owing to the backward flow of the flood-waters of the Waal, be guided by means of an independent channel on the south. The separation of the Rhine and the Meuse will then, for the first time, be made complete.

If we merely considered on a map the two broad double mouths with which the delta of the Rhine opens to the west, we might easily be deceived into supposing that a superabundance of excellent waterways, with fine cross-communications, lay open here to large ships. The breadth of all these channels, however, has been gained by the washing away of land, and they are all rendered shallow by the alluvial deposits from the rivers.

This detracts from the superiority which might have been expected of the mouths of the Rhine as compared with those of the Scheldt, close by on the south. Although only the Wester Scheldt is of value to navigation, even of this the channel requires constant care and watchfulness in the interests of the active traffic that streams, not only towards the estuary and the harbour of Flushing, the port of Walchern, but also towards the river port of Antwerp, which lies upon tidal waters. The importance of this main centre of Belgian international traffic is threatened by no rival in its own country. Beyond the mouths of the Scheldt a close line of dunes begins again, offering an excellent bathing-place for land-rats, and a most undesirable field of labour for the seaman. For while, at a short distance in front of the high dunes of North Holland, stretch the uniform depths of the "Breite Vierzehn" (fourteen fathoms everywhere); in front of the coast of Flanders are the Flemish Banks, beginning even at the estuary of the Scheldt, and increasing towards the south-west both in number and in danger. The southern part of the Flemish coast belongs to France; but the natural southern boundary of the North Sea lowland is not reached until the Pas de Calais, where ends the North Sea itself.

The opening of this strait has decisively altered the character and importance of the North Sea. It is an extensive but excessively shallow basin of water. "A sheet of writing-paper is thicker in proportion to its length and breadth than is the stratum of water covering the bed of the North Sea in comparison with its superficial area." The southern part, with which alone we are concerned, up to latitude 55½ (from Alnmouth to Blaavanshook), has an area of 75,500 square miles, and an average depth of

18 fathoms. Not only is there a wide stretch along the coasts which is shallower than this, but even in the midst of the North Sea rises the Dogger Bank, running northeastward from the estuary of the Humber and very rich in fish. It exercises an important influence upon the course of the tide which comes into the North Sea between the Shetlands and Orkneys, follows the coast of Scotland southward, and then runs to the west and south of the impeding Dogger Bank. It is at Texel that this tide meets the tide from the Channel, which controls the south-west of the sea and goes on to wash the shores of Germany in a mainly eastward course. Tides are the breath of fresh life to a sea. The tide runs far up, too, into the rivers of the country, swells their waters daily to a higher power, and, more effectually than any human labours can, opens up a broad belt of shoreland to navigation. Like a greeting from the ocean, the flood-tide rushes up to the wharves of Antwerp, Bremen, and Hamburg, inviting the inlands to take part in the traffic with far regions.

Note on Authorities.—The best general view of the results of modern investigation is given by Wahnschaffe, *Die Ursachen der Oberflächen gestaltung des Norddeutschen Flachlandes*, 1901.

A more particular explanation of Fig. 16 is given by K. Keilhack (*Jahrbuch der Königlichen Preussischen Geologischen Landesanstalt* for 1878, and *Verhandlungen der Gesellschaft für Erdkunde zu Berlin*, xxvi., 1899).

An exact account of the German seas is afforded by the marine handbooks of the German Admiralty.

Rudolph Credner deals with *Die Enstehung der Ostsee* (*Geographische Zeitschrift*), i., 1895).

CHAPTER VIII

CLIMATE

THE whole continent of Europe enjoys climatic conditions which are in every respect moderate, and this advantage naturally reaches the highest development in its centre. Considerable differences in essential points are not, however, excluded, and are of great assistance to various forms of cultivation. Indeed, Central Europe possesses, within the lines of demarcation set by the great mountain formations, some share in all the zones of climate belonging to the continent, the Arctic alone excepted.

The differences of latitude, especially in the east between Memel (55° 43′) and the mouth of the Bojana (41° 52′), are too great to fail of producing sharp contrasts of character. The widest departure from the normal conditions of Central Europe is certainly exhibited by the hot cauldron of Herzegovina, where Mostar displays a July heat of 78.6° Fahrenheit, and has to prepare itself every year for an average maximum heat of 106° Fahrenheit. Here, only thirty miles from the Adriatic, the African height of the summer temperature brings about such an intensification of annual variations as is only produced elsewhere by the cutting winter cold of the continental climate. In the interior of Germany, however, the variations of temperature in higher and lower latitudes are so thoroughly compensated by the elevation of the country towards the south, that on the yearly average Munich is 2.2° cooler than Schleswig.

Let us glance at a few figures:—

Place.	Latitude.	Height.	Mean Temperature.			Difference.
			Annual.	January.	July.	
	Degrees.	Feet.	Fahr.	Fahr.	Fahr.	Fahr.
Cambridge .	52.13	39	50.4	38.7	63.7	25.0
Utrecht . .	52.5	43	49.8	34.7	65.1	30.4
Hanover . .	52.22	190	48.4	33.6	64.2	30.6
Berlin . .	52.30	157	47.5	31.6	65.1	33.5
Posen . .	52.25	213	46.6	29.3	65.5	36.2
Warsaw . .	52.13	394	45.1	25.9	65.8	39.9

The decrease of mean annual temperature towards the east arises from the considerable intensification and longer duration of the cold in winter, while the heat of summer does not diminish as we go eastward, but increases; and the clearest mark of entry into the climate of the continent is the conspicuous increase in the yearly variation of temperature.

The mild winters of the west are an advantage highly to be prized. It is true, the figures of the temperature in the shade are by no means decisive. The damp and stormy winter weather of the North Sea is far more trying to human powers of endurance than is a brilliant, still winter's day in Poland, with the snow crackling underfoot. Persons in delicate health, however, do well to avoid the cutting winter airs of the east, and to take refuge in the mild nooks of the Rhine Valley at Wiesbaden or Baden-Baden, or, better still, on the delightful east shore of the Lake of Geneva, where some of the advantages may be enjoyed which are only to be found in full perfection on the other side of the Alps, along the Riviera, or at the sheltered spots of the Adriatic, at Abbazia, Lussin Piccolo, and Ragusa. The exclusion of harsh winds is combined in all these places with the charm of a more varied flora, enriched by species which cannot endure the harder winters of the continental climate.

Unquestionably this mildness of climate has a very favourable effect upon the economic life of the west.

The North Sea, whose shores are edged with ice only in the very hardest winters, and even then mainly along the most enclosed inlets, has in this respect immeasurable advantages over the Baltic. The rivers of the mainland are far more liable to be closed by ice, not only because their waters are fresh, but also because the obstruction by ice of one single spot suffices to hinder the navigation of long lines of water. While England and France enjoy in normal years full freedom of internal traffic, in Germany we find the winter stoppages of navigation growing more and more frequent and lasting as we go farther east. Even on the Rhine ice appears regularly, and that not merely in the Netherlands, where sailing sledges have been made to fly over the glassy surface of the ice. At Cologne the river is reckoned to have ice upon it for an average period of twenty-one days.

The more easterly rivers of Germany may be expected to be covered every year by firm ice; but the times at which this sets in and the period for which it continues are so variable, and depend so much upon local conditions, that it is difficult to draw up comparative dates and figures, and still more difficult to reconcile the demands of commerce, which must have fixed times for the fulfilment of contracts, with the variable states of the waterways. Their usefulness is destroyed, not only on the days when they are coated with ice, which on the Bohemian Elbe are estimated at twenty, at Magdeburg twenty-four, on the Silesian Oder thirty, at Warsaw sixty, and at Tilsit ninety-four, but for the whole period between the first appearance and the final disappearance of ice from the river. The average duration of this period on the Upper Elbe and Oder is some eighty days, in Pomerania nearly 100, and at Tilsit, according to the observations of many years, 134. Sometimes dangers arise from the breaking up of the ice in the upper reaches of northward flowing rivers, while the lower reaches are still blocked. On the Vistula, in particular, very severe and dangerous floods often result from this cause. On the Danube, whose mouth is in the same latitude as that of the Po, and its Bulgarian reaches in the same latitude as the Arno, this possibility might naturally be supposed improbable. But it is precisely in the lowest reaches that the ice is most apt to form, and the mean duration of it is set at thirty-seven days; for forty years the Danube has only been entirely open in eight winters, and was once blocked for ninety-four days. The mean temperature of the coldest month on the Sulina estuary (27° F.) corresponds with that of Trondhjem and Bodö (Lat. 67°).

The course of the isothermal lines for January runs S.S.E., while that for July crosses at a right angle and runs E.N.E., thus rising to higher latitudes in the interior of the continent. The same course is followed within certain limits, imposed by the severe winter cold of the east and the consequent shortening of the period of vegetation, by the line of growth of many plants, and particularly of cultivated produce requiring a high point of summer heat to bring the fruits to maturity. The best instance is furnished by the grape. Towards the ocean it ripens as far as the south of Brittany (47½°), and thence north-eastward to Liège and Bonn (50.43°); a few outposts on the Werra and Saale extend above 51°; and it reaches its nearest to the Pole at Bomst on the Obra (52° 10′). Up to this point the limit of the vine agrees very decidedly with the July isothermal line of 66° F., but now towards the interior of Eastern Europe it ceases to rise with this line, and being pushed back by the severity and the occasional length of the winter, turns suddenly towards the south and south-east. The extreme line of cultivation for maize approximately accompanies that of the vine from Brittany to the province of Posen, but is not compelled to retreat so far southward in the east, because the winter cold does not affect this purely summer crop. Thus the high summer temperature of the continental climate assures to its domain conditions particularly favourable to the ripening of summer crops. Especially high requirements in the matter of warmth are met by two continental countries, Hungary and

Roumania, in which the mean day temperature of a hot season lasting two or three months is 68° F. Only one district occupies a worse position in regard to the pursuit and the success of agriculture than might be expected from its geographical latitude. This is the district on the shores of the Baltic, where a most ungenial spring delays considerably the awakening of vegetation.

In general, however, the climatic influence of the ocean prevails in Central Europe, for westerly winds are the most numerous and the most powerful, since the region lies south of the lines along which most of the barometric depressions pursue their north-eastern or eastern course.

Mountain walls form a protection against strong winds, but only for plains that are not very extensive. The lowland of the Upper Rhine and the basin of Bohemia feel the benefit of their embracing mountains. The flat plains of Hungary, however, are so large as to become a suitable arena for the gambols of very whirlwinds, which sport so wildly with the snow of winter and the dust of summer, as to offer a foretaste of the storms of the Pontic steppes. The east of Roumania, indeed, actually falls under the sway of these storms. The marked prevalence of north-east winds at Sulina and Bucharest occurs chiefly in the summer, and is then connected with the system of winds of the Mediterranean basin; the tail of the north-east trade wind, which sets the air above it moving towards the hot African deserts, extends beyond the 45th parallel of latitude. But even in winter north-east winds frequently occur here as parts of a cyclone circling round a barometric minimum over the Black Sea. A similar winter development of an area of low atmospheric pressure over the Adriatic, amid colder surrounding countries, occasions the frequent north-east winds of Istria and Dalmatia. Their much dreaded violence, however, is caused by the closed mountain walls of the Karst, which so delay the exchange of air between the sea and the interior, that the difference in the temperature and density becomes very great, and the adjustment only occurs with storm and violence. The streets of Trieste are swept by the Bora with gusts of such violence, that in open places only stretched ropes can keep the pedestrians from being blown down. This wind is felt to be cuttingly cold, yet in its hasty descent from the mountains it has been somewhat warmed, and is own brother to the "Föhn" (violent south wind) of the Alps. The latter is always related to the general distribution of the atmosphere throughout Central Europe, and rages suddenly, dry and warm, through the northern valleys of the Alps, at times when the air is drawn up from them and as it were pumped out by a space of more rarefied air—a passing depression—to the north. The Alps, the Karst, and the Southern Carpathians together often form a mighty barrier dividing two different tracts of weather. If they divide a region of high atmospheric pressure from a depression, the atmosphere will be set in motion in a slanting course over the ridge and will descend rapidly to the area of less density. But if a tract of high atmospheric pressure lies above their ridges, dividing two regions in which cyclones move and prevail, then there will be calm in the valleys among the mountains, accompanied by fine weather, but often in winter-time also by very severe cold.

The important influence of the superficial conformation of the land is even more immediately perceptible in regard to the distribution of moisture. Every rain-chart is closely related to a relief-map. The mountains compel currents of air to rise, to be chilled, and to condense their vapour, but they obtain much moisture only if the air has previously collected much in the places of its origin. Thus the ocean remains, under all circumstances, the first source of rain, and the fact that the prevalent winds are those blowing off it is of importance to Central Europe. If we could ascend in a balloon to a height from which the whole of Central Europe would be surveyed at one glance, the veils of mist spreading over it and thickening towards the north-west would emphatically show us how important is the part played by the ocean as parent of our streams

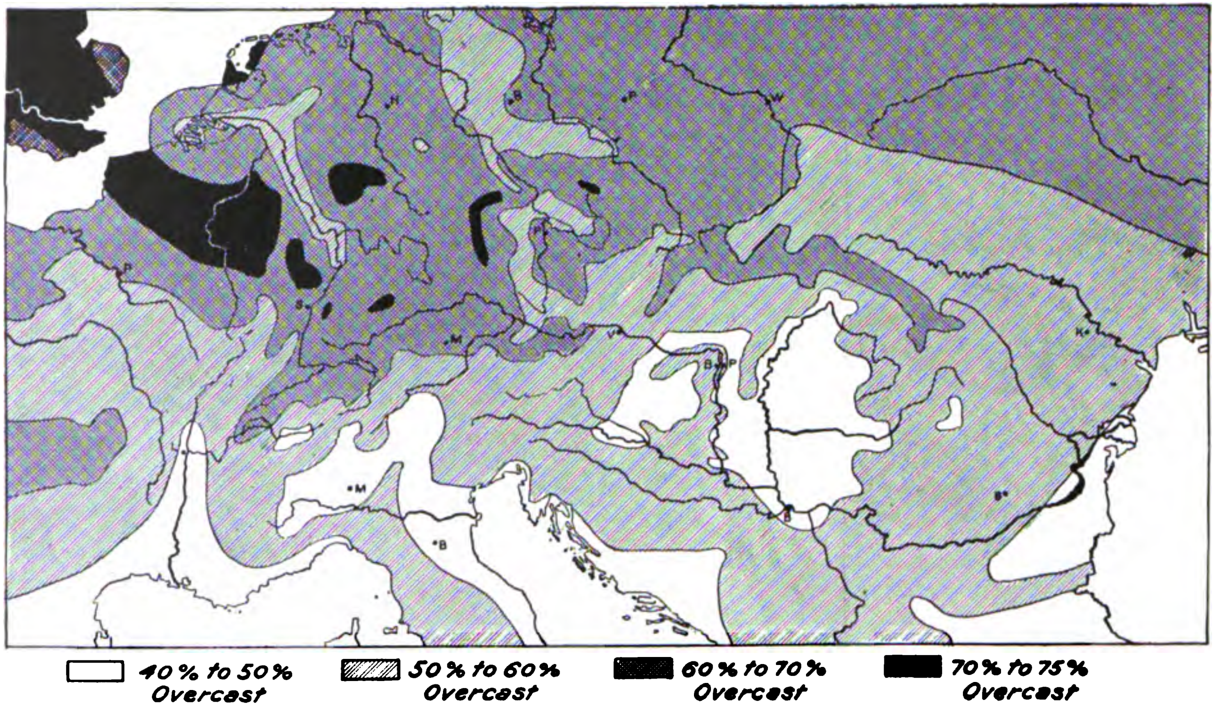

40% to 50% Overcast
50% to 60% Overcast
60% to 70% Overcast
70% to 75% Overcast

FIG. 20.—The Sky of Central Europe.

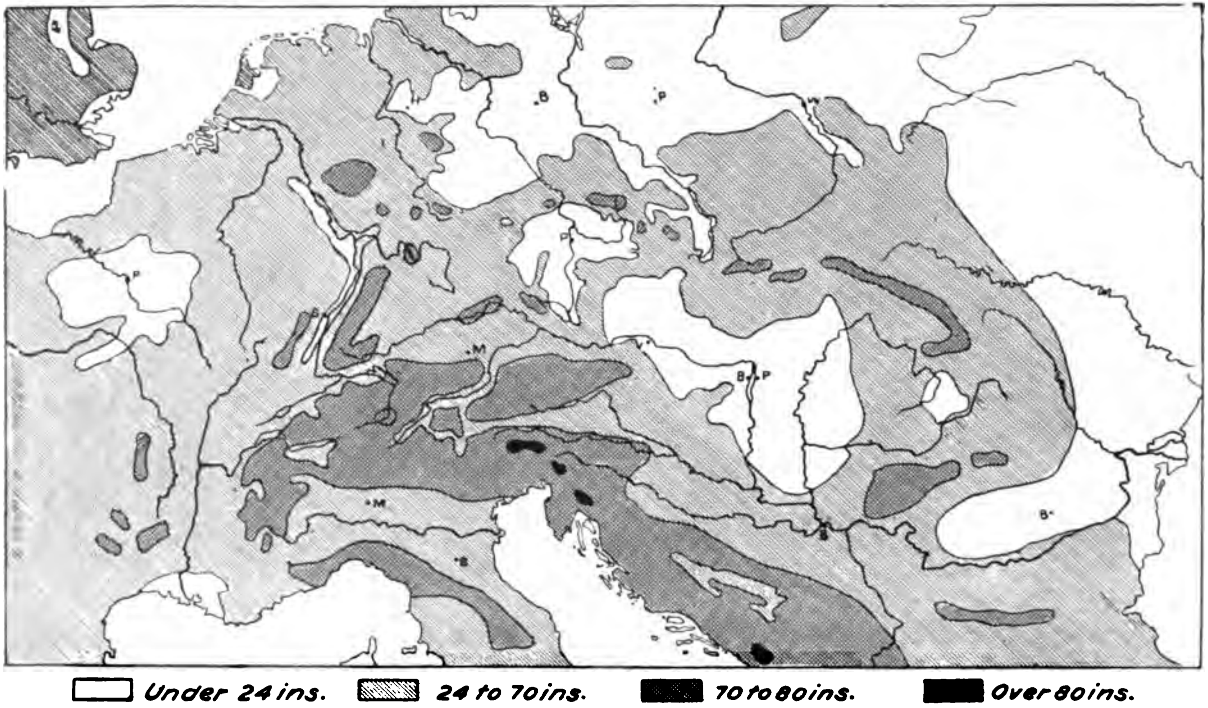

Under 24 ins.
24 to 70 ins.
70 to 80 ins.
Over 80 ins.

FIG. 21.—The Rainfall of Central Europe.

and rivers. Exclusive of mountain tops, we should see but one district—on the North Sea—where about 75 per cent. of the sky area appeared to be overcast. The clearest skies in all Central Europe, with only 40 per cent. of cloud, would lie over the southern islands of Dalmatia, the coastal strip of Ragusa, and some considerable stretches of the Hungarian plain. To these sunny areas seem to succeed next certain Alpine valleys, but the apparent freedom of these from cloud is mainly due to the enclosing mountains, which conceal from the spectator the lower, more cloudy sky towards the horizon. Modern observers have taken the more advantageous course of measuring not the total area of sky overcast with cloud, but the more important duration of sunshine. Among the stations of Central Europe where such observations are made, the widest difference is between Hamburg with 1236 hours of sunshine in the year, and Pola with 2546 (three or four hours, and seven hours per diem).

The dull cloudiness of the North Sea, however, and the clear brilliance of the Adriatic heaven permit no conclusions as to the amount of rainfall, for the very heaviest rain-storms of the continent occur precisely on the north-east shore of the Adriatic, which rises precipitously from a warm sea to rugged heights. This fact was noted only a decade ago, when observatories were placed upon the heights, whose abrupt walls—like those of an Alpine lake—stand around the Bocche di Cattaro. The capital of Montenegro, Cettinje, was found to have an annual rainfall of 115 inches, and the Dalmatian village of Tserkvitse (3445 feet high) of 199. That this almost tropical effusion of rain is not solely due to the local influence of a nook amid high mountains is shown by observations of the country behind the Quarnero, taken from Hermsburg on the Schneeberg, in Carniola. There, too, at a height of 3272 feet, 125 inches of rain were measured, while in the Alps only a few stations show a fall of more than 80, and the rainiest spots of the Central German mountains attain only 40 to 60 inches. All these figures stand far higher than those which apply to low-lying areas; these diminish south-eastwards from about 27 inches in the North Sea region to 17 on the estuary of the Danube. Local minima of rainfall occur in the interior of enclosed basins surrounded by mountains, such as the Valais, the Upper Rhine Valley, the heart of Bohemia, the south of Moravia, and Hungary; also under the lee of some single mountain block—the plains of Magdeburg, behind the Hartz Mountains, for instance.

The coast of the Adriatic is the only region belonging to the zone of summers with little rain, in which many sorts of cultivation can only be carried on in the hot season by means of artificial irrigation. All the other countries of Central Europe have rains at all seasons, and it is precisely in the summer that most of them have their highest rainfall, this maximum being more distinctly marked in the interior than in the neighbourhood of the sea. Continual rains sometimes destroy the finest hopes of harvest. Only the south-east, the lowlands of the Danube in Hungary and Roumania, are free from this peril, and they are exposed to the contrary danger of drought. Often, in July and August, when clouds gather that promise rain, they pass off in the dry glowing air that lies over these wide plains, mocking the thirsty wanderer with the illusions of the *Fata Morgana*. The special climatic influence of the plains so weakens the rainfall of the hottest summer-time in the Danubian region that the maximum is reached as early as June, and the two succeeding months are marked by no further increase; on the contrary, the showers grow fewer, and only increase to a second maximum in September and October.

While the heated surface of the earth here causes a deviation from the normal distribution of rain in Central Europe, a precisely contrary effect is produced in autumn along the shores of the ocean. The quicker cooling of the mainland in the period succeeding the autumnal equinoxes encourages the vapours brought by mild winds from the warmer sea to condense, and so cause the autumn maximum of rainfall that occurs in the parts of Europe adjoining the ocean. This autumnal maximum is most completely marked in Western France and the British Islands. But the first stages of its development begin on the German shores of the North Sea and in the Netherlands.

A special position in regard to the periodic distribution of rainfall is occupied by the mountains. In summer, indeed, they are often washed by mighty downpourings, which sometimes rise to such violence that the rivers become dangerously swollen, even far out in the plain. But on the whole, the considerable quantities of rain received by the mountains show no such marked concentration of the maximum into the summer as is the case in the plains, but rather an inclination towards more regularity of distribution, and, in particular, towards a richer abundance in winter. The snow never fails to appear, turning the ground of the forest into a highway where the sledges move freely and carry wood either to the great smooth roadway or to the rivers. Snow-fields, too, saturate the earth with moisture and feed sources and brooks. The rivers of Alpine districts enjoy their fullest supply from the glaciers in the height of summer, at the very time when increased evaporation and the consumption of water by vegetation leave other rivers poor and weak. Fed by the melting waters of garnered snow and ice, they swell to fullest abundance, and offer an increased power for the service of labour and traffic.

One point at which this advantage of the Alpine rivers is particularly noticeable is at the junction of the Iller at Ulm. The clear dark-coloured Danube emerges in quiet and modest cheerfulness from the Jura ; only after its union with the Iller from the Alps does it become a river. The latter brings, in summer especially, the far stronger volume of water, yet the basin from which it gathers its store is not half so large as that of the Upper Danube. As the Danube is far surpassed in relative volume by the Alpine rivers, so in turn it far surpasses the Elbe. Against the 950 cubic yards carried past Passau in a second by the Danube, the Elbe at the point where it comes out of Bohemia, though it has behind it a somewhat larger basin, can set only 390. The mighty volume of water carried by the Rhone from the Lake of Geneva (330 cubic yards per second) offers in Switzerland no other waterway than the local one of the lake's surface. More important are the masses of water carried by the Rhine into the Netherlands (3270 cubic yards per second) and by the Danube into the Black Sea (10,470 cubic yards). These quantities bear impressive witness to what the atmosphere can do in despite of the powers of the earth. Lands divided by rising barriers of mountain are linked together in the bonds of intimate common life by the ribbons of the green Rhine and the blue Danube.

Note on Authorities.—A classical account of the climate of Central Europe is furnished by Vols. I. and III. of J. Hann's *Handbuch der Klimatologie.*

The climatic maps in Berghaus's Physical Atlas, III., 1887, are by the same author.

The map of average clouding (Fig. 20) is taken from Elfert (Petermann's *Mitteilungen*, 1890); that representing the rainfall (Fig. 21) has been compiled from various sources (Hann, Supan, Angot).

The rivers of Germany are described in monumental official monographs.

CHAPTER IX

THE PEOPLES

WE must rest contented with twenty centuries as the period during which the movements of population in Central Europe can be known with certainty. The obscurity of remoter days is illuminated only by archæological discoveries that go back more and more faintly to the epoch—perhaps two hundred centuries ago—in which the ice of Scandinavia and the Alps, making its last great advance, narrowed the domain in which the earliest traceable inhabitants of Central Europe were struggling, aided by their instruments of stone and bone, to maintain a scanty existence.

The first wave of population whose westward course has left traces enabling us to follow it with approximate certainty was Celtic. It has left behind it in the district of the Danube and in South and West Germany an unmistakable trail of geographical names. The rivers Danuvius and Rhenus and most of their tributaries bear names of Celtic origin; and the words of Tacitus are still applicable to the home of the great race of the Boji: "The name Boihemum (home of the Boji, Bohemia) still continues to exist and to denote the former history of the country although its inhabitants have changed." This name of the Boji was indeed so persistent that it clung even to the latest of the Germanic races that came out of this district: the Bajuvari (Bavarians). The Elbe (Albis) and the Oder (Viaduas), on the other hand, and the Havel (Habula) and the Spree, which lie between them, have German names; they mark the earliest settlements from which the Germani gradually spread over the whole of Central Europe. Previous even to the year 180 B.C. the

Bastarni—the first of the Germani who obtained access to the Mediterranean—had appeared at the mouth of the Danube; and before that century closed Cimbri and Teutons were pressing down from the shores of the North Sea and crossing the Pyrenees and the Alps. From the time of their first steps towards the subjugation of Gaul, the Romans were always making endeavours to pen in the advancing Germani behind the Rhine. In the time of Tacitus, the Rhine, the Danube, and the Vistula were reckoned as the approximate boundaries of the Germani. The future inheritors, however, of their borderlands were already established on their east: the Aestii in the amberland and the parts east of it; and the Venedæ, the foremost of the Slavonic races, to the south of them, east of the Vistula.

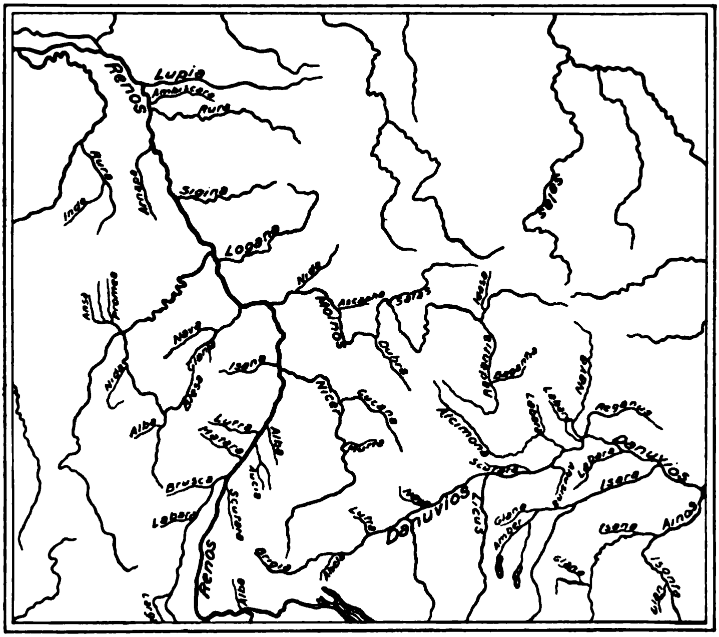

Renos
Lupia
Rura
Rura
Inda
Sigina
Logana
Nida
Moinos
Ascana
Salas
Nava
Glana
Isana
Nida
Alba
Nicer
Lutra
Alba
Brusca
Labara
Renos
Lutra
Danuvios
Licus
Glana
Amber
Isara
Labara
Reganus
Nava
Danuvios
Ainos
Isonta

FIG. 22.—Celtic River Names in Germany.

The Roman Empire was successful for more than three centuries in opposing a firm barrier to the advance of the Germanic tribes, although the position of it did not always remain quite the same. When once the Romans had carried their conquest across the Alps, which had so long been regarded as a barrier, the extreme length of the Empire's northern border was felt to be a burden. Strong rulers aimed to shorten the boundary line by carrying it forward to the Elbe and to the outer edge of the mountains of Central Europe. Finally, in the long-run, the Romans continued to hold only the rivers Rhine and Danube, and also, for a considerable period, the angle of country lying between their upper reaches. There the most smiling districts of Germany invited the Romans, and the peoples protected by them, to make permanent settlements. The course of the Main, running northward at the western end of the Spessart, was the natural support of the frontier line, which, enclosing the Wetterau and the Rheingau, passed over the heights of the Taunus and the western edge of the Westerwald, and ended on the border of the provinces of Upper and Lower

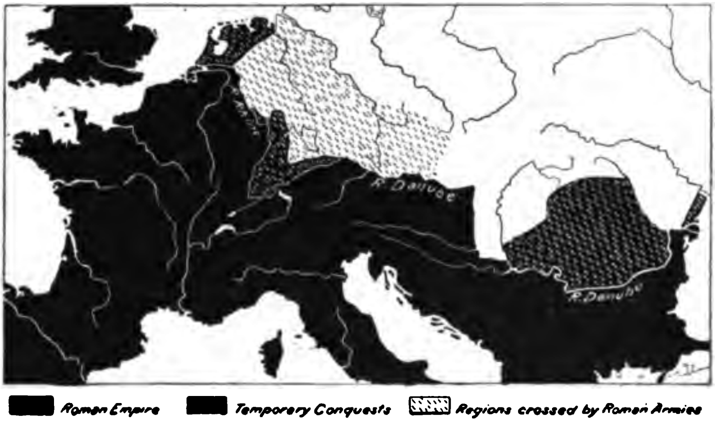


FIG. 23.—Advance of the Romans into Central Europe.

Germania. In the other direction, it continued southward for fifty miles in a line so absolutely straight as to amaze modern surveyors, to Lorch near the Hohenstaufen. At this point the frontiers of Upper Germania and Rhætia met in a right angle that seemed like a repetition of the bend of the Rhine at Basle, and the frontier of Rhætia ran north-eastward in front of the northern edge of the Swabian Jura through the deep valley of the Ries, the name of which recalls that it once belonged to Rhætia, then across the tableland of the Franconian Jura, intersected by the Altmühl, and so nearly to Kelheim on the Danube. This frontier (337 miles long) was not a military position; but it was the real boundary sharply marked, and its protection was facilitated by the construction of a wall and ditch, which could be adequately guarded by small forces in each of the camps and towers that were established at intervals of some ten miles. Vespasian fixed this line of border, which was established and maintained by his successors until the year 253. It has been thoroughly elucidated by

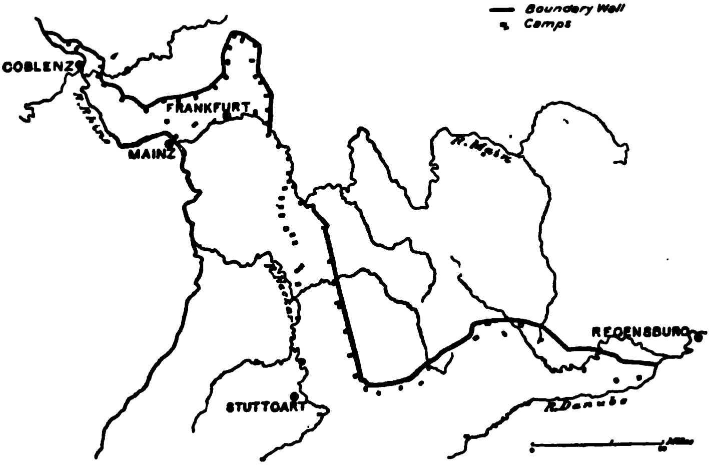


FIG. 24.—The Roman Limes of Germania and Raetia.

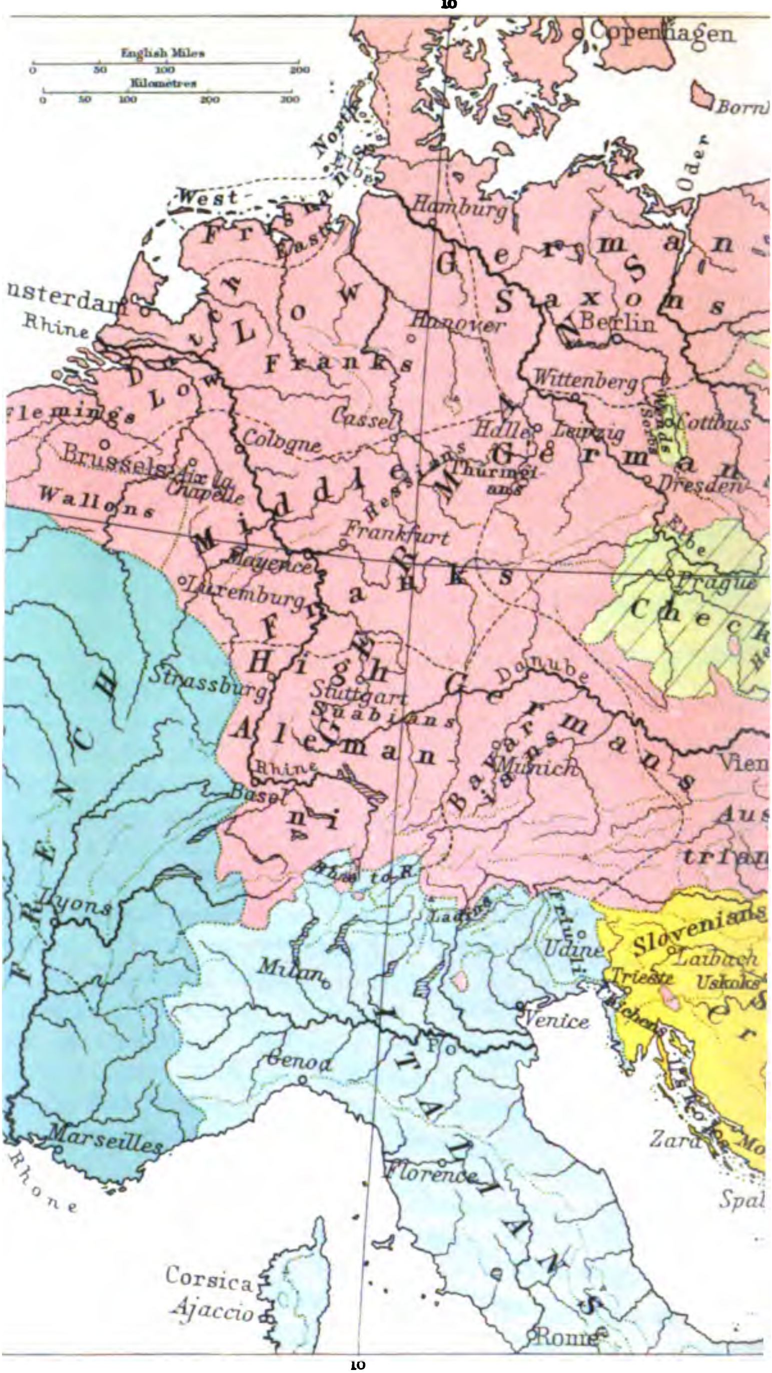
modern investigations, while the so-called Wall of Trajan, on the isthmus of the Dobruja, remains to be examined in the future.

The boundaries of the Roman Empire in Central Europe are of importance in the history of its civilisation, for the ineffaceable impress of Roman civilisation and Roman institutions was not bound up with the continuance of Roman nationality. In regard to Central Europe, indeed, the observer is tempted to maintain the direct contrary. Even when we leave the regions of great Romanic populations in Western and Southern Europe, which still extend over considerable areas in Belgium, Lorraine, West Switzerland, Ticino, and South Tyrol, we find the Romance idiom persisting in connection with the retired life of mountain districts that lie aside from the great currents of population and social life. This is plainly perceptible in the Romansh valleys of the Grisons, South Tyrol, and Friuli. In the case of the Roumanians, too, the home in which they have maintained their tongue throughout a thousand and a half-thousand of stormy years, was not the fertile expanse of plains, lying in a significant position internationally, wherein they have now grown up to be a great nation and a highly important state. The Roumanians regard Transylvania, the centre of the modern expansion, as their original home; the Magyars, on the other hand, maintain that they themselves were the earlier possessors of Transylvania. In the comparative absence of historical records, the point can only be decided by a thorough examination of the language, and impartial philologists conclude from slight indications that the Roumanian tongue grew up in the Balkan countries. The Romanised population of those countries, strengthened by the immigration of Roman provincial subjects who crossed to the right bank of the Danube when Dacia (Transylvania) was evacuated, would appear not to have been completely destroyed by the foreign elements pouring in upon it. The Valachs of the Pindus and of some communes of Istria on Monte Maggiore (numbering about 2500 persons) and the Valachs of Eastern Moravia—who, however, have long since practically become Slavonic—form the outlying points that mark those sporadic settlements of the Roumanian race by which most of the Balkan Peninsula and the whole curve of the Carpathians were occupied. The period at which the Roumanians increased on the north of the Danube and in the Carpathians is uncertain, but assuredly they did not come thither at so late a date as the Magyars would like to believe. As early as 1164 they were established near to the frontier of Galicia, and during the succeeding centuries took a considerable share in colonising that land. At the present day they occupy a compact country reaching northward from the Lower Danube and the Dniester as far as the Bukovina and the Marmarosh, and westward beyond the edge of the Transylvanian mountain district towards Grosswardein and Temeshvar.

The movements of population out of which this race has now emerged again disturbed the racial boundaries in the north of Central Europe, and with lasting results. In the course of the great migration, Germanic tribes were scattered over all the countries of Europe, and even over the opposite shores of the Mediterranean. While the wandering peoples, whose military fame had filled the world, became gradually Romanised in foreign lands, the mother country had grown smaller and smaller. When the conquests of the Franks, which had already extended to the ocean, were turned against their blood relations on the east, and when, one after another, the Alemanni, Thuringians, Bajuvars, and Saxons had found themselves obliged to submit to their superior might, the invaders came upon Slavonic peoples in the very midst of ancient Germania, on the Upper Main and the Saale. These peoples had possessed themselves of the whole coast of the Baltic from the mouth of the Vistula to the peninsula of Wagrien and the inlet of Kiel, where they were immediate neighbours of the Danes. When we reflect that the modern development of French nationality was already beginning to take shape in the west of

"Francia," and that purely German territory did not everywhere touch the western border of the Rhine basin, we perceive that the Germany of that period, in comparison with ancient Germany, had not only been pushed towards the south-west, but had also, notwithstanding the addition of the Alpine foreland and a part of the Alps, suffered considerable diminution ; it comprised indeed only about three-fifths of its former extent. The recovery of the lands lost on the east begins with Charlemagne, and for a long time proceeds but slowly. Not until the twelfth century did the tide of conquest quicken ; then Mecklenburg became German, and the Mark of Brandenburg and the Mark of Meissen rose into prosperity. The most important acquisitions of the thirteenth century were Prussia, conquered by the Teutonic Order, and Silesia, peacefully occupied by German peasants and towns under German law. At the same time German colonisation in Bohemia proceeded through the wide frontier forests, which had not up to that time been touched, while in Southern Moravia German settlers began to make clearances in the great woodlands which had till then formed the northern boundary of the Ostmark, the Eastern Mark or German border country along the Danube. After the suppression of the Hungarian invasions, this Mark had from the eleventh to the thirteenth century been making progress under strong rulers. Within the Eastern Alps, too, the Bavarian tribes had made a successful advance, driving back the Slavs. These at one time had come up to the sources of the Drave and into the valleys of the Glockner and Venediger groups, but they now retired into the main basin of Carinthia. Not only the whole district of the Drave, but also that of the Mur and Mürz up to the Semmering, is full of Slavonic place-names which testify to the size of the field here filled by German colonising activity.

What, it may be asked, were the initiating forces that led to this vast movement of the Germans towards the east ? Was this movement due to a deliberate far-seeing policy of the German Emperors ? By no means. The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Berlin
Wittenberg
Wends
Sorbs
Cottbus
Flemings
Brussels
Aix la Chapelle
Cologne
Cassel
Halle
Leipzig
Middle
Hessians
Thuringians
Germans
Dresden
Walloons
Frankfurt
Elbe
Prague
Mayence
Luxemburg
Franks
Chech
He
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Strassburg
High
Germans
Stuttgart
Suabians
Danube
Alemanni
Bavarians
Munich
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Austrians
Rhaeto R.
Lyons
Ladins
Friuli
Udine
Slovenians
Laibach
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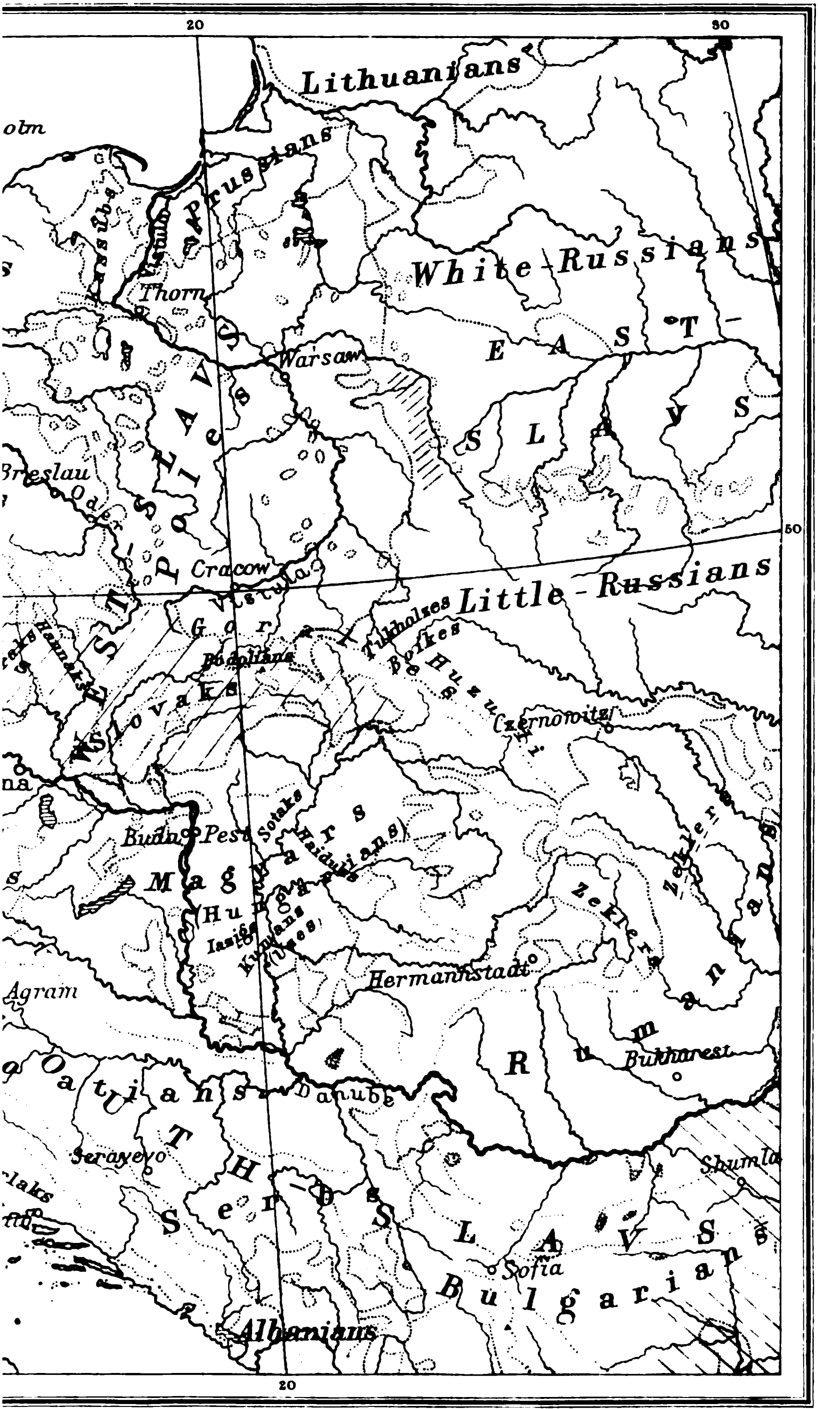
OPE – ETHNOGRAPHICAL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J G Bartholomew

German advance was often quickened by the fact that it coincided with the advance of Christendom. Many invasions assumed the character of crusades, and even more powerful was the persevering support of ecclesiastical organisation, and the progress of German bishoprics and German convents which brought with them conversion, intellectual leading, and social improvement. The permanent results, however, of all this activity were dependent even more upon the important fact that, while the East was in every respect backward, the German race was at that time peculiarly fitted to send thither not merely valuable elements of a superior civilisation, but also many sturdy colonists who would carry on active progress. The Germans had multiplied very rapidly, and in every branch of industry were incontestably superior, excelling in agriculture as well as in manufacture and mining, in commerce as well as in seamanship. The Slavonic rulers saw with pleasure great tracts of worthless virgin forest turned into productive land around German villages, while little towns with free German institutions, arose among them as centres of trade and communication. They felt their own power increased by the addition of actively producing and taxable subjects, and were eager to lead German settlers into those parts of their countries which were still but imperfectly opened up.

The thirteenth century saw German colonies established at the foot of the Tatra, in the metalliferous mountains of Upper Hungary and in Transylvania. The German Hanseatic League, too, following the lead of Lübeck, put forth mercantile colonies, which held unlimited control of the Baltic trade, and had a considerable share in the traffic of the North Sea. The great work achieved during this period was the removal of the sharp boundary-line that had previously divided the German race from its neighbours on the east, and the formation throughout and around the territories of these neighbours of islands of German civilisation.

This advance of the Germans continued until nearly the middle of the fourteenth century. Then in Scandinavian countries, as well as in Lithuania, Poland, Bohemia, and Hungary, a general spirit of resistance awoke among the various peoples who, under German teaching, had grown up to a fuller self-conscious life and a more ambitious sense of nationality. The decline of the German Empire deprived all the threatened outposts, the Hanseatic League as well as the Teutonic Order, of the support so essential to them in their hour of greatest need. The weakness of the broken Empire allowed every shock to existing arrangements to develop into a permanent loss of German possessions. The advent of the Reformation, too, brought with it dangers to the existing boundaries of the nation. Nearly everywhere it set the Catholic clergy fighting against the Germans on behalf of alien tongues and customs. In these circumstances the past five centuries have seen many a district once subjugated to civilisation by German industry overcome and destroyed by the rising of foreign races. Only here and there has the wise activity of some far-seeing ruler in the last century or so called upon the colonising capacity of the Germans and set them to recover tracts of land which, owing to prolonged neglect or barbarous devastation, had become depopulated. The district of Southern Hungary, between the Danube and the mountains of Transylvania, that was torn from the Turks in 1718, and was colonised by a strong contingent from Swabia, rose in the course of the eighteenth century to a degree of prosperity which it had never reached before.

In addition to external circumstances which combined to impede the persistence of the German tongue in regions which it had once conquered, there was a marked tendency in the tongue itself towards divergencies of development, and this also seriously weakened its position. A High German and a Low German group of dialects are distinguishable. While the members of the former group remained closely related, and while the tendency to an independent development of the Allemannic dialect in Switzerland was overcome when there was yet time by the influence of the High German written language, the Low German dialects increased so much in diversity that before the High German had attained to a fully fixed form they had developed into practically separate languages. A little to the east of the Lower Rhine and the Issel lies the boundary between the Lower Franconian and Lower Saxon or Platt-Deutsch dialects. Two related tongues branched off very early from the Lower Saxon—the Anglo-Saxon, which on English soil became the groundwork of the English language, and the Frisian. The isolation in which the Frisians have dwelt from the earliest times of German history, along the shores and islands of the North Sea and beyond the great marshlands, was especially favourable to an independent development of language. The continuance of it, however, was seriously threatened by the inroads of the sea. Only scattered areas of the old Frisian language remain, and these will gradually disappear. To the west of the Zuyder Zee Frisian has already died out; but to the east West Friesland remains the firmest centre of Frisian-speaking population. In East Friesland and in the Saterland of Oldenburg hardly 2500 persons now understand the tongue of their fathers, but the North Frisian dialect, still spoken by 2000 Heligolanders and by nearly 18,000 inhabitants of the western islands and shores of Schleswig-Holstein, retains more vitality.

Frisian and Lower Saxon have had a marked influence upon the development of the Dutch language, the main groundwork of which was the Lower Franconian. The beginnings of its growth into an independent written language date back to the thirteenth century, but its complete separation and deliberate employment were not secured until after the rising of the Netherlands against the power of Spain. The Flemish tongue, spoken by a majority of the inhabitants of the kingdom of Belgium, has gradually won equal rights with French, and the Flemish speech is now once again approximating more and more closely to the written Dutch language, with which, however, it does not yet altogether coincide.

While in Holland and Flanders the sense of kindred with the West Germans persists, the Danes of North Schleswig—the only place where the soil of the German Empire is occupied by an outpost of Scandinavian blood—stand out in sharp contradistinction to the Lower Saxons. They cannot reconcile themselves to having ceased to rule the duchies. But they are scarcely more numerous than the Lithuanians who continue to subsist in East Prussia, mainly in the northern point of the country beyond the marshes and woods on the right bank of the Pregel. Since the extinction, in the seventeenth century, of the language spoken by the original Prussians, these people form the only living branch in Central Europe of the Aestii, who once ruled the country up to the Vistula.

Even in Roman times the banks of this river were attained by the foremost tribes of the great Slavonic race. The wall of the Carpathians—that invaluable bulwark of Western Europe—divided the Slavonic hordes which in the sixth century poured down upon Central Europe into two great streams. The more northerly spread across the whole breadth of the North German lowland and sent detachments of Slavonic population through the valley openings of the Western Carpathians and through the Moravian Gap into Moravia and Bohemia, while the southerly—following the Avars—pushed across Southern Hungary into the Eastern Alps, occupying their valleys and ramifications.

In the middle of the seventh century it appeared as though the Slavs of the Alps and those of Bohemia would join hands, but the valley of the Danube offered an easy roadway for the movement of the Bavarians and their eastern neighbours, and it proved impossible for a permanent Slavonic power to bar this highway. The fates of the Western and the Southern Slavs remained divided.

The Slavs of the North German plain have mainly become Germanised. The great race of the Wends, who ruled the land between the Elbe and the Oder, has left but a fast-disappearing remnant of its tongue along the Spree between Bautzen and Kottbus. A much larger district remains in West Prussia, cut off from the great Polish-speaking districts by the almost entirely German lowlands of the Vistula, Brahe, and Netze. The early conversion of this little country to Christianity preserved it from the fate prepared by the German Order for the heathen Prussians. Thus preserved, the Slavonic nationality gained strength by being long connected with the kingdom of Poland, and now continues undiminished because German influence is slight in this country of little traffic and only small towns.

Here in West Prussia, as in the continuous district of kindred speech, which includes the south of East Prussia (Masuria), the Kulmerland, and the greater part of the provinces of Posen and Upper Silesia, the German movement is arrested. At many points, indeed, a Polish advance has been distinctly perceptible during the last twenty or thirty years, and will hardly be stopped by the endeavours of the Government to promote further German colonisation. The power of resistance belonging to the Slavonic element of the Prussian kingdom is everywhere strengthened by the Catholic clergy, except in Masuria, where there are Protestant Poles. The equalisation of Catholics and Protestants, of Poles and Germans, was not indeed quite just, but it was simple and effectual. Every step that favoured the extension of the German language was regarded with distrust as an attack upon religion. That difficulty, however, has always existed. Others have arisen more recently in districts impoverished and decayed under Polish rule from the care for education and for social progress which was the duty of the Government. Only under the Prussian supremacy has a Polish middle class been called into existence; now there are not only artisans and shopkeepers, but doctors, lawyers, and journalists, and these men are making the little towns, the old strongholds of Teutonism, into centres of Polish propaganda. The more active this becomes, the less is the inclination of Germans to remain in this district, while the Poles are growing rapidly. This growth of Slavonic population is further increased by immigration from the east. Every spring brings whole trainloads of labourers, "Sachsengänger," from the Polish parts of Posen and Silesia, and also from the adjoining Russian provinces, into the "beetroot country," that is to say, the district of the middle Elbe. Here they help to get in the harvest of the fertile land for the great sugar industry, receiving in return a wage far in excess of what they could earn at home, and many remain permanently. Nor is the current of Polish immigration to the great industrial centres of the empire smaller. There are places on the Westphalian coalfields where the proportion of Polish immigrants is as high as 15 per cent. of the total population. Here, in the densely populated area of an industrial district, are to be found some 100,000 Poles. The gaps left in the artisan class of the eastern provinces by such emigration are inevitably filled by Polish workmen called in from Russia or Galicia.

Economic conditions have thus brought about a modern immigration of races which the Imperial Government, although powerless to prevent, naturally enough beholds with no satisfaction. Similarly in many towns of Bohemia that were formerly purely German a group of Czech workmen will now be found, forming a minority that is rapidly increasing and full of demands. In Vienna, where there are more than 160,000 Czechs, they have attained to preponderance in many trades. In the industrial centres of Saxony, too, they are increasing. The growing power of the Slavs in Bohemia is, however, mainly due to the fanatical energy of national spirit which during the last fifty years has so penetrated the whole people as to make every nerve of their physical power and every pulse of their intellectual life subservient to the advancement of the nation's strength and glory, neither the rights of others nor established tradition being allowed to counterbalance. A recollection of the freedom with which they have been permitted to pursue their ends under a German dynasty and in a state comprising far more Germans than Czechs, and of the great results which they have been permitted to attain, may perhaps keep the pan-Slavist inclinations of the Czechs within bounds. How different would have been their fate if, instead of being surrounded by Germans, they had ever had the great Slavonic empire even for a neighbour!

Compare the fate of the Poles. The district occupied by their language lies in a well-defined square between the lakes of the East Prussian hill-country and the ridge of the Carpathians, the angles being nearly marked by Birnbaum (province of Posen), Suwalki (Lithuania), the Jablunka Pass, and Przemysl. Lemberg (Lwow), the capital of Galicia, lies amid a Ruthenian district, but within one of those islands of language the frequent occurrence of which along the Bug marks that river as an earlier and now lost eastern boundary of the Polish nation. The upper and middle districts of the Warta and Vistula are thus occupied almost completely by the Polish nationality. Any attempt to establish a "national" division of the continent would have to take account of Poland, which owes both her greatness and her misfortunes to her border position between Eastern and Central Europe. It is a fact of importance in the history of the world that this country belongs by religion to the West and not to the East, and that its whole past was dominated by the Roman and not by the Byzantine civilisation. Even at the present day the Poles form a nation which may base hopes of a better future, not only upon their history and upon powers that have been preserved, and perhaps matured in hard trials, but also upon their numbers. Half of them are held down by the iron hand of Russia. As the soft earth rises beside a heavily built dam, so on the hither side of the boundary of Russia the Polish people rebels against a milder government in Prussia. The Austrian Poles are the most fortunate. They hold the balance in the conflicts of other nationalities, and require to be paid for any service to the Government by rewards for Galicia. Thus while jealously guarding the autonomy of their province, they exercise a decisive influence upon the rest of the empire. It is instructive to observe the Poles playing a ruling part in Galicia. There the Ruthenians (Little Russians), who also people the north of the Bukovina, belong to the Greek Church and bear the heavy yoke of Polish government.

Very different from the position of the Poles in Austria is that of their neighbours on the other side of the Carpathian ridge, the Slovaks of Upper Hungary, whose social conditions are of the very poorest. Quite unlike German Austria, Hungary is not seriously troubled by the neighbouring Slavs on both sides of her territory.

When the Slavs (Sclavini), about the year 530, began their advance towards the Balkan peninsula, they were established to the north of the Lower Danube. How long the plains there and the whole mountain country of Transylvania were occupied by a Slavonic population no historical record exists to show. Numerous Slavonic names of rivers and places, however, bear witness to the prolonged use of a Slavonic language in this region. It was only by the development of Roumanian nationality and the immigration of the Magyars that the broad belt of population was formed which now divides the Slavs of the Alps from the Ruthenians. In that wide South Slavonic domain which extends from the Dobratsh near Villach to the coast of Thrace, and from the innermost angle of the Adriatic to the Black Sea, the most important line of division is that running from Scutari through Nissa to Widdin. This line joins the two points in the water boundaries, the Drave and Danube on the one hand and the Adriatic on the other, when they cease to remain parallel, and having followed a south-eastward direction relatively near to each other, diverge towards east and south. The division coincides with the course of a Roman road, the shortest highway from the Adriatic to the Dacian frontier, and along this naturally marked connection the old Albanian stock advanced towards the interior, going north-eastward nearly as far as Nissa.

Their language is essentially the ancient Illyrian altered in form by prolonged Roman influence and long contact with the Slavs. Between this farthest outpost of the Albanians and the highest spot in the valley of the Timok where Roumanian is spoken, remains an isthmus on the language-chart which is but some sixty miles wide, connecting the territories of the Servians and Bulgarians. The great isolated domain occupied by the language of the Servian races has in its interior but few districts with remnants of German speech, and at its edges only a strip at Trieste and on the west shore of the Adriatic of that Italian civilisation which in the Dalmatian towns is overwhelmed by the Slavonic idiom. The lingual differences between the Slovenes in the south of Styria and Carinthia, and in Carniola, and the Croats and Servians (to whom the Montenegrins belong) are less important than the religious differences which make a division—often unfriendly—between the Roman Catholic Slovenes and Croats, and the Servians who belong to the Greek confession. These latter are the mainstay of the idea of South-Slavonic unity, which, however, could only be realised by a complete revolution in the political conformation of the continent.

The Bulgarian nation occupies an entirely independent position, inhabiting both slopes of the Balkans and their foreland, but its hopes for the future possession of Macedonia are in direct opposition to those of the Servians. The Bulgarian name originally belonged to a Finnish tribe, which left its home between the Volga and Don before the close of the fifth century and shook the Byzantine Empire by its attacks. Being supported in these by Slavonic races, the Bulgarians, even at the time when they began to found a mighty empire in the Balkan countries, became gradually assimilated to the Slavs. Their brilliant history seemed to be ended when they were brought under the Turkish yoke. They bore this heavy time of tribulation, however, without yielding.

The great Uralo-Altaic race to which belonged the ancestors of the Bulgarian people, has at different times exercised a profound influence upon the destinies of Central Europe. The advance of the Huns gave the impetus to that great movement of races with which ancient history closes. The Avars took a violent part in the fresh conformation of Europe which marks the opening of the Middle Ages, and even in 1241 an inroad of Tartars threatened to overrun the eastern frontier countries of Central Europe, which were then just beginning to develop their civilisation. Among the peoples who resisted the Tartar incursion was a race which had become established in Central Europe, and had there formed a powerful state, the Magyars, who were akin to the Finns, but had been a little influenced by the Turks. As the Sarmatian Jazyges had done in ancient, and the Avars in mediæval times, so the swarms of Hungarian riders had overflowed the lowland of the middle Danube. This district, which is climatically an outpost of the steppe country about the Black and Caspian Seas, became once more the theatre of a life native to the steppes. From their new home the Hungarians for centuries kept the lands west of them in terror by their far-reaching predatory excursions, which extended to the North Sea, to the Atlantic, across the Pyrenees, and in Italy to Naples and Taranto. One horde of riders completed a circuit of the Alps. Not until the decisive victory of Otto the Great on the Lech (in 955) were these raids brought to an end, and the Magyars compelled to confine themselves to a settled existence within their lowland. There their power grew by the inclusion of succeeding races from the steppes and by absorption of subjugated national elements. A severe crisis was caused in the sixteenth and seventeenth centuries by the Turkish invasion, which seemed as if it would gain a firm foothold. But as soon as it had been reconquered by the Austrian forces Hungary recovered itself, and the national spirit of the Magyars increased rapidly. Since 1866 they have obtained an independence which they use energetically to strengthen their own nationality at the expense of the other races belonging to the empire, although they form not an absolute, but only a relative majority. In no other state of Europe has the government been so successful, and in no other except Russia so unscrupulous, in the means by which it has tried to force upon the other elements of the population the language of the dominant majority.

In Hungary the fact stands out most clearly that the present conception of nationality is dominated by the token of language and has little to do with descent. The movements of population have everywhere brought together racial elements of so widely differing origin that very few districts can claim to have kept a population which is the almost unmingled offspring of a single race. It is possible that the Jews come nearest to being able to claim the distinction of pure blood. From the western districts of the Mediterranean, over which they had become scattered during the Roman Empire, they came eastward with western civilisation. At present the belt occupied

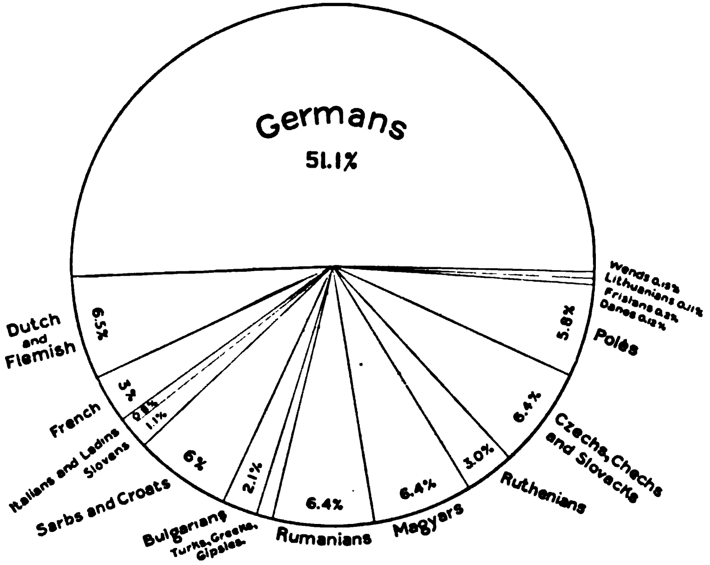

FIG. 25.—Diagram to show Nationalities.

most thickly by them lies on the eastern frontier of Central Europe. From Moldavia, through Eastern Hungary, the Bukovina, and Galicia, to Russian Poland, stretches a connected tract in which ten to fifteen per cent. of the population consists of Jews. Here they are established as a nation, having their own tongue, a dialect of German with Jewish words and terms, and their own dress. In the Vistula government their numbers have lately been increased by the severity with which they were hunted out of interior Russia, under a decree restricting their right of settlement to the western departments of the empire. Among the provinces of Germany, Posen, Hesse, and Alsace are those in which they are most numerous; and among the towns, Frankfort-on-the-Main in particular. They are also relatively numerous in the Netherlands.

The enormous variety of peoples united in Central Europe need a common tongue for mutual communication. German is understood everywhere from Galatz, Sofia, Sarayevo, Trieste, Geneva, and Antwerp far into the interior of Russia. Only the most backward regions of Servia and Montenegro must be excepted. All the rest of Central Europe, consciously or unconsciously, willingly or unwillingly, belongs to the sphere of German civilisation. Life, the inexorable, pours water into the wine of national fanaticism, and is duly at hand to prevent its branches from shooting to heaven.

Note on Authorities.—The ancient ethnography was established by the admirable works of Zeuss, 1837, and Müllenhoff, 1870–1887.

The peoples of the present day are pretty nearly all to be found in the Danubian regions, and have been excellently described by experts in the twenty-four volumes of *Die Oësterreich-Ungarische Monarchie in Wort und Bild*, 1884–1902, which were published at the wish and with the co-operation of the Crown Prince Rudolf.

Der Deutsche Volkstum, 1898, is a work edited by Hans Meyer and produced by ten learned men; the vividly written geographical section was prepared by A. Kirchhoff.

CHAPTER X

THE STATES

CENTRAL EUROPE contains a considerable number of districts which, by their conformation or their river system, are either so bound together within, or so distinctly shut off from without, as to be adapted to become the nuclei of states. The demands of these natural formations have sometimes been overridden by the arbitrary creations of alien and conquering powers; the invading Turks and the French under Napoleon tore off in wild greed whatever of Central Europe they could snatch; and the Roman Empire, in its day, considered nothing but the securing of convenient boundaries for its Mediterranean possessions. All of these trampled under foot the true political life that was growing up in Central Europe. Of all the great conquerors in this part of the world, only one worked in the direction of political construction and permanent development—Charlemagne.

He forced the German races, which had previously been divided between the Alps and the North Sea, into a political aggregation, and this, after the disruption of his great dominion, formed the groundwork of the German realm. The Rhine, of which from 870 onward the whole basin belonged to this kingdom, was the natural guarantee of its coherence. The rapids at Bingen, however, which in those days had not been brought into subjection, interrupted the navigation. A cause of still more importance in perpetuating the division between North and South Germany was the old diversity of race. The Saxons, between the Hartz Mountains and the North Sea, always submitted unwillingly to a king of another race, and did not give an unconditional support to kingship unless it was borne by one of themselves. While their interests were involved in contact with the Slavs, the Danes, and the sea, the Swabians, in the kindlier regions of South-Western Germany and Switzerland where traces of Roman civilisation still lingered, sought relations with Burgundy and Italy, and found gates of international trade for themselves in the seaports of those countries. The Franks, who dwelt between these peoples from the Moselle to the Upper Main, might have reconciled their diverging interests had they succeeded in gaining power enough to keep the royal seat in their land. But this changed its place, being sometimes with them and sometimes with the Saxons or the Swabians, and although the choice and coronation of the rulers belonged to Frankish towns, Frankfort and Aix-la-Chapelle, the mediæval German Empire entirely lacked the influence of a capital city to dominate, unite, and bring into line the currents of national life. The uniting power of kingship was weakened by the lack of a fixed centre, but even more by the fact that the highest aims of the imperial policy did not lie within the borders of Germany, but in the wider horizon of the conflict of the Empire and the Papacy. The more distinctly imperial policy became riveted to Italy, the more certain was the separate political development of North Germany in a course of its own. Even the destruction of the power of Henry the Lion did not put an end to this independent activity of the north. The sea power of the German Hanseatic League, and the expansion of the Teutonic Order as far as Livonia, arose without help from the supreme Imperial Government. Later on, the selfish policy of imperial dynasties favoured the disintegration of the empire.

The Swiss Confederation from the fourteenth century onward detached itself by degrees from Germany, and even dared to attempt the conquest of part of the imperial territory. The delta of the Rhine, too, became less and less firmly united to it. It was Charles the Fifth, however, who as heir of Charles the Bold, was the first to reckon this district as part of his Spanish patrimony, and in doing so to prepare for it an entirely independent fate. The end of the Middle Ages, with the constant friction between nobles and towns, completed the political disintegration of South-Western Germany, and brought about that pernicious array of minor states that left this region a helpless prey to greedy neighbours as soon as their attacks should be invited by the interior decay of the Empire.

That condition was produced by the Reformation. Failing to permeate the whole of Germany, it caused a cleavage of the Empire, and the bitterness of feeling grew to such heights that German aid helped foreign powers to become masters of German country. The Thirty Years' War destroyed the northern and western frontiers of the Empire. Only the weakness of Germany rendered possible the artificial creation by Sweden of a great northern power, which occupied not only the most valuable tracts on the coast of the Baltic, but also the mouths of the Elbe and the Weser. Even at the period of this catastrophe the north of Germany, on the whole, had fought for the Reformation and the south against it. The subsequent course of events favoured the development of a duality of political powers. While the western frontier was but weakly defended against the rapacity of Louis the Fourteenth, Austria bent its whole strength to driving back the Turks and reconquering Hungary. The aspiring Electorate of Brandenburg, on the other hand, undertook the protection of the north and east, and wrested the first gains from Sweden and Poland. The emancipation of East Prussia from the suzerainty of Poland gave to the great Elector a firm footing of power outside the Empire, and to his successor the foundations of kingship. The struggle of Prussia to attain a position of equality with Austria began with the conquest of Silesia, and was further displayed in the share taken in the division of Poland. If in the struggle against Napoleon Austria showed the more stubborn resistance, in the last fight for freedom Prussia did the utmost and strained every nerve. In the German Confederation, whose thirty-seven secondary and minor states grouped themselves in varying political formations around the two great powers, the balance of predominance wavered. But Prussia's claim to the supremacy of the German people was favoured by the circumstance that in 1815 it only recovered so much of its great Polish possessions as was absolutely indispensable to the junction of its eastern frontier, and that by way of amends it sought an equivalent, partly in Saxony, partly along the Lower Rhine in the former territories of the spiritual Electors, whom the Revolution, which dug the grave of the old German Empire, had swept away. Prussia thus became more German and extended to the threatened western frontier of Germany. Nor was this all. Enlightened and foreseeing, it entered, by the foundation (in 1833) of the Customs Union, upon the path leading to the economic union of the greater part of the nation. The decision, however, between the "Greater German" idea which regarded the union of all German races, "Wherever sounds the German tongue," as the aim and principle of every future change, and the "Lesser German" idea of firm unity for all Germans outside of Austria, could only be reached by blood and sword. A ground of quarrel arose between the two great powers of Germany over the fate of the duchies of Schleswig and Holstein which they had emancipated from the rule of Denmark in 1864. Arms decided the question in favour of Prussia. That Power now proceeded to the junction of its provinces, which had hitherto been divided into two groups. Some states which had taken part with the enemy were incorporated, and all the twenty-one states of North Germany were united into the North German Confederation. As the four southern states of Germany were also induced to enter into alliance, France found all Germany except Austria united to resist it in 1870. The reward of victory was the recovery of Alsace with a part of Lorraine and Metz. The inspiring sense that at last a united national power, and that alone, had succeeded in defending the frontier which had so often been swept away by hostile attacks, led all those who had participated in the victory to unite voluntarily in forming the German

Empire and raising the King of Prussia to the position of German Emperor.

The German Empire has natural and satisfying boundaries on almost all sides. Extended between the Alps and the North Sea, between the Bohemian mountains and the Baltic, it suffices to itself, threatens no neighbour, covets no foreign territory, but is resolved to permit no one to lay hand upon its own.

On the western side of Germany lie, like fragments broken from the walls of an old fortress, Switzerland, Luxemburg, Belgium, and the Netherlands. In their present form they are all creations of the nineteenth century.

Until the French Revolution the Swiss Confederation was an alliance for mutual protection of small independent states, an aristocratic gradation of rights existing, not only as between the various states but as between the various districts of the separate states. This league of North and Central Switzerland had no fixed connection with the two independent confederations of the Grisons and Valais, though permanent friendly relations subsisted. The French Revolution overthrew these conditions and established a Helvetian Republic upon a foundation of equal rights. The recovery of sovereignty by the cantons, which had been effected within it, was confirmed in 1815, and Switzerland received the advantage of increased territory and the guarantee of her neutrality by the great powers. A democratic movement, which did not attain its aim without violence, subsequently led to greater centralisation. Since 1848 Switzerland has been not a confederation of states, but a confederated state.

More complex was the evolution of the kingdom of the Netherlands, which was constructed by the Congress of Vienna out of three territories swallowed up by the revolution and incorporated into France—the old Habsburg Netherlands, the United Provinces of the Netherlands, which had been free, and the bishopric of Liège. It was given to a prince of Nassau and Orange. The spirit of the Vienna Congress has here left a fine memorial of itself in one of the most ridiculous frontier lines to be found on the map of Europe. The frontier towards Rhenish Prussia is not formed by the Meuse north of Maaseyk, but by a line running for more than fifty miles at a distance of from three to five miles from its right bank. While neutrality was guaranteed to these three territories, the King of the Netherlands entered the German Confederation on account of another part of the domains assigned to him, the Grand Duchy of Luxemburg, the inheritance of which was settled in the male line. Luxemburg became a German fortress and received a German garrison.

In making this fresh political settlement the Powers underrated the significance of the fact that ever since the taking of Antwerp in 1585, which confirmed the Spanish power and the Catholic religion in the south, leaving the Reformed north to pursue its free development alone, the two parts of the Netherlands had had different destinies. Acute opposition to the Hague Government was not slow to arise in the Southern Netherlands. Although the two main currents of this opposition, the Clerical and the Liberal, were actuated by very diverse motives, they made common cause when the revolution of Paris in 1830 gave them a chance of raising their banner. France gave them the victory, and secured the independence of the old Habsburg Netherlands and the bishopric of Liège under the name of the kingdom of Belgium, to which was added the greater part of Luxemburg, and even a number of German communes belonging to that state. The neutrality of the newly formed state was guaranteed by the Powers. The breaking up of the German Confederation in 1866 brought to the front the question of the future of the remaining portions of Luxemburg. The King of Holland wished to sell Luxemburg to France, but a storm of indignation in Germany prevented this. Luxemburg ceased to be a German fortress, but remained in the Customs Union. In 1890, a queen succeeded to the crown of Holland; all connection with that kingdom ceased, and a purely German dynasty came in. The inhabitants of Luxemburg speak German, but the official tongue of the Government is French.

The buffer states which a cautious diplomacy has placed between France and Germany depend for their existence not entirely upon the guarantee of the Powers, whose promise has never yet been put to any very severe test, but upon their own prosperous strength. They have proved their claim to independence by their own successful labour, and have become valued and indispensable members of the family of Europe's states.

On the eastern frontier of Germany things have followed a very different course. The broad opening of the North German lowland towards the vast plains of the east has been a source of anxiety as often as the Slavs have succeeded in establishing a powerful state. The growth of Poland under Jagello's dynasty, after its union with Lithuania (1386–1572), hemmed in the domain of the Teutonic (German) Order. East Prussia passed through this period as a Polish fief surrounded by Polish territories. But the more Poland extended its supremacy, the clearer became its lack of fixed natural boundaries, and the greater the disproportion between the strength of the ruling nation and the number of subjects speaking other tongues. Only a strong Government could have achieved the task of maintaining a position so threatened. But the power of the monarchy diminished rapidly from the time when it became elective. From the beginning of the eighteenth century Russian influence decided the selection and the action of the kings. No person acquainted with history can maintain that the downfall of Poland robbed the Central European Powers of any protection against the gigantic power of Russia. Poland had long abdicated that function. Although herself neutral in the Seven Years' War, she served as a basis of the Russian operations. Immediately afterwards, the influence of Russia upon the internal troubles of Poland increased to such a degree that the subjugation of the entire country by Russia seemed to be at hand. The question for the

German Powers was not whether Poland could be preserved or revived; the only choice before them was whether they would see the country swallowed whole by Russia or secure to themselves some part of the expiring country's inheritance. For Prussia that was a question of life and death. If the whole expanse of Poland fell gradually into the arms of Russia, if her iron grasp were to be laid upon all the course of the Vistula and the German town of Dantzig, then East Prussia, a province which had shown itself to be untenable in isolation, would certainly disappear into the maw of the monster at the first opportunity. The Russians had already occupied it for four years during the Seven Years' War.

Frederick would have endangered the future of his own country if he had failed to seize the opportunity of establishing the connection between his eastern marches and Pomerania. Beyond this he did not go. It was his successor who loaded the state with too great an addition of Polish territory, which proved itself at the first critical moment not a support, but a worthless burden. Thus in 1815 Prussia finally withdrew within narrower bounds, the narrowest indeed which would suffice to secure the indispensable connection between the Prussian and the Silesian wings of its territory. All Western Europe felt the impending danger of seeing Russia pass beyond the meridian of Dantzig. The worthlessness of the soothing concession that Poland should be added to the despotic empire as a constitutional monarchy could not for a moment escape such a statesman as Stein. What he foresaw became fact in 1832. From that time onward there was no longer a kingdom of Poland, but only a Government of the Vistula.

The possibility, indeed, of being simultaneously attacked on both sides lays on the German Empire the burden of heavy military preparations. But as the warlike dispositions of its western and eastern neighbours grow and become more menacing, so do all its members become the more closely knit together. No one can venture to say the same of the German Empire's natural ally, Austro-

Hungary. The occupation of the southern and of the northern foreland of the Tatra up to the salt-mines of Wieliczka and Bochnia (in 1769 and 1770) was the first step towards the partition of Poland, and that event had ominous consequences to the coherence and inner equilibrium of the Austrian state.

One of the most essential causes tending to the unsatisfactory condition of the whole Austrian state is the fact, that the threefold historical character of the natural and ethnological divisions which meet to the east of the Jablunka Pass is not represented by a corresponding political trinity, but by a disproportionate duality. To the Hungarian half of the empire in its vigorous and prosperous unity stands opposed a monstrous residuum, with economic powers diminished by sacrifices for the sake of the Polish appendages, and political powers divided and neutralised by the particularist politics of the Poles. These pursue the easy and profitable task of encouraging dissension between the other races and making their own profit out of them. That is comprehensible enough; but foreigners find it more difficult to understand why it is that the German nationality, most threatened in the struggle, does not hold together, and why the German clericals come to support the Slavs in the repression of their own nation.

Hungary naturally gains by the political paralysis of the Austrian half of the empire, or, to use the official designation for once, of "the kingdoms and countries represented in the Imperial Council." Thanks to the deliberate and energetic action of its statesmen, that kingdom secured surprising advantages as far back as 1867, when the "Ausgleich" (compromise) established new political life among the peoples of the empire.

Transleithania, the kingdom beyond the Leitha, was acknowledged for all time as on a full equality with the rest of the countries forming the empire, which on their part might very well bear the name of Cisleithania if it were not that lands lying far to the east are most unnaturally reckoned with them. A crying contrast to this political equality is exhibited by the differing degrees with which the common duties to the common state, to the army, the navy, and foreign policy are fulfilled.

The Magyars succeeded without any very serious opposition from the other races in getting into their own hands the direction of Hungary's constitution and administration, they having already pacified the Slavs of the south by a separate compact in 1868. The kingdom of Croatia and Slavonia—Fiume excepted—was to retain its viceroy (Banus), its diet, full autonomy in matters of religion and education and in some departments of law and administration; above all, the Croatian language was to be retained, not only in all the departments subject to the kingdom's autonomy, but also in transactions with the Croatian sections of every ministerial department, and even in the speeches of Croatian deputies to the Hungarian parliament when imperial questions were under discussion. The name of Dalmatia is joined with that of Croatia and Slavonia in the title of the King of Hungary. Its appearance is something more than an historical reminiscence. The constitution of 1867 safeguarded the right of the kingdom to demand the restoration of Dalmatia and its union with Croatia, but the Magyars have not the slightest intention of taking away those Slavs from Austria and favouring their union with the other Slavs of the south.

The question, however, of the incorporation of Bosnia and Herzegovina into the empire by which they were occupied in 1879, will certainly some day come to the front, and with it their claim to national representation. This event would be the first stage in the advance of Austria-Hungary towards Salonica. Only 21½ per cent. of the inhabitants of these countries are Roman Catholic, while 23 per cent. are Greek Oriental Christians. The history of the land, which preserved its independence side by side with Servia until the Ottoman Empire overcame both, and the persistence of a considerable body of Mahomedan population (35 per cent.) will make it easy for an intelligent Government to keep the country developing along independent lines. Austria-Hungary can never suffer the threatening floods of the "Great Servian" agitation in Servia and Montenegro to break over Bosnia.

The peculiar name of Herzegovina recalls an episode in the endeavours of the district to unite itself with the west. It is derived from a native despot, who in the middle of the fifteenth century, withdrew from submission to Bosnia, and under the title of Herzog (Duke), gave his allegiance as a feudal vassal to the Emperor, Frederick the Third. This portion, however, of the "occupied territory" has long been under the direct influence of Montenegro. Here arose the insurrection of 1875, which had been quietly fomented by Russia, and was fatal to the Turkish rule. Who can tell whether on the eve of great events this "scrap of Herzegovina" may not once more draw the eyes of the world upon her?

Of the Servian countries, Montenegro was established by Russia, and is a mountain fastness unconditionally devoted to that Power. Originally a feudal dukedom of the Servian monarchy, Czernagora became, after the battle of the Amselfield which destroyed that kingdom in the year 1389, a place of retreat for fugitive bands of Servians. The brave and hardy shepherd race has held out in its wild and inaccessible mountains against the attacks of the Turks, and has never been subjugated by them. The family of their ecclesiastical rulers, the hereditary Vladika of the country, developed in the nineteenth century into a real dynasty, a royal house, which drew closer the links of alliance with Russia forged in the previous century, and, protected by Russia, passed successfully even through so severe a crisis as the defeat of 1862. The active participation of Montenegro in the great decisive struggles with Turkey was rewarded by a considerable extension of territory, which doubled the country's area and raised its importance even more signally. Montenegro not only gained fruitful valleys and lowlands, but also that access to the sea at Antivari and Dulcigno to which it had so long aspired in vain.

On the north-east a strip of Turkish territory divides

Montenegro from Servia only by thirty miles. The mediæval Servian kingdom, after a brief hesitation as to whether it would unite itself with Rome or Byzantium, became the seat of an autonomous Servian Church belonging to the Greek confession, and attained its greatest strength, at the expense of the decaying Roman Empire of the East, before the middle of the fourteenth century. King Stephen Dushan then ruled from the Danube to Ætolia, from the Balkans to the Bocche di Cattaro, and from the Struma to the shores of Epirus. The independence of the kingdom was destroyed by the Turks at the battle of the Amselfield (Kossvo-polye) in 1389. On the same field, at the later dates of 1448 and 1680, the most hopeful efforts of Hungary and Austria for the freeing of Servia were defeated. It was not until 1804 that the internal weakness of Turkey offered to the Servians the opportunity of a successful rising. After fierce battles of varying issues, a dealer in pigs who had risen to wealth became chief (Knes) in 1817, and in 1830 was acknowledged by the Porte as Prince of Servia, becoming the founder of the existing dynasty. When the Porte, under pressure from the European Powers, withdrew its troops from Belgrade in 1862, and from three smaller fortresses in 1867, the country was left to develop in freedom. Its evolution was unstable and stormy. In 1876 Servia hastily, and without consideration, opened the war with Turkey and was only saved by the intervention of the Powers from the direct results of defeat. At the partition of Turkey a considerable addition of territory was awarded to Servia, and tracts of country were united to her in which the Albanian and Bulgarian languages were spoken.

While the influences of Austria and Russia have predominated alternately in Servia—which has called itself a kingdom since 1882—it is by the latter Power that the culture and development of Bulgaria have been moulded. The Bulgarians possess a mediæval history rich in events and full of catastrophe. The Turkish rule succeeded, and was here particularly oppressive. The insurrection of 1876, which was suppressed not only with severity but with ferocity and with sanguinary violence, gave Russia a ground of intervention. The Congress of Berlin awarded to the Principality of Bulgaria the territory between the Danube and the Balkans, and in addition the country about Sofia at the sources of the Struma and the Isker, while the whole of Macedonia was restored to Turkey, and Eastern Rumelia, between the Balkans and the mountains of Rhodope, was placed under the suzerainty of Turkey as an autonomous province. A revolution in Philippopolis displaced the government of the viceroy in 1885, and paved the way for a union with Bulgaria. Alexander of Battenberg, the first Prince of Bulgaria, with a full knowledge that he was contravening the decision of the Powers, supported this revolution, and called himself Prince of the Two Bulgarias. The protest of the Powers emboldened Servia to attack the principality at this grave crisis, but the Bulgarian army, trained under Russian officers, victoriously defended the frontier. The union continued to subsist, notwithstanding the dangers to which Russian intervention in the free development of Bulgaria exposed the country.

In Bulgaria the severity and long continuance of Turkish rule had so completely broken the thread of historical development, that an entirely new political edifice has had to be constructed in our own time, having no possibility of any link with the far past. The Turkish power has had far less influence upon the fate of the southern and eastern foreland of the Carpathians. Here two states, Wallachia and Moldavia, grew up in the Middle Ages, peopled by Roumanian inhabitants of the Greek faith, and standing in dependent relations to Hungary which gradually weakened. Both became subject to Turkey but retained their Christian Boyars—a native aristocracy holding great landed possessions, and their Hospodars, chosen from among this aristocracy and the heads of the Church, and no caste of Turkish lords succeeded in settling within their domain. Not until the eighteenth century, when the influence of Russia became threatening, did the Porte adopt the plan of giving the Hospodar's office to Phanariot Greeks—who paid well for it—and of changing these rulers often. The Congress of Paris in 1856 accorded to the Danubian principalities the fullest measure of internal independence ; the payment of tribute and the denial of independent foreign relations were almost the only real signs left of the suzerainty of Turkey. In 1857 the two principalities demanded the formation of a single Roumanian state under a prince of foreign extraction. This aim, which was opposed by the private interests of adjacent Powers, was reached by progressive steps. A

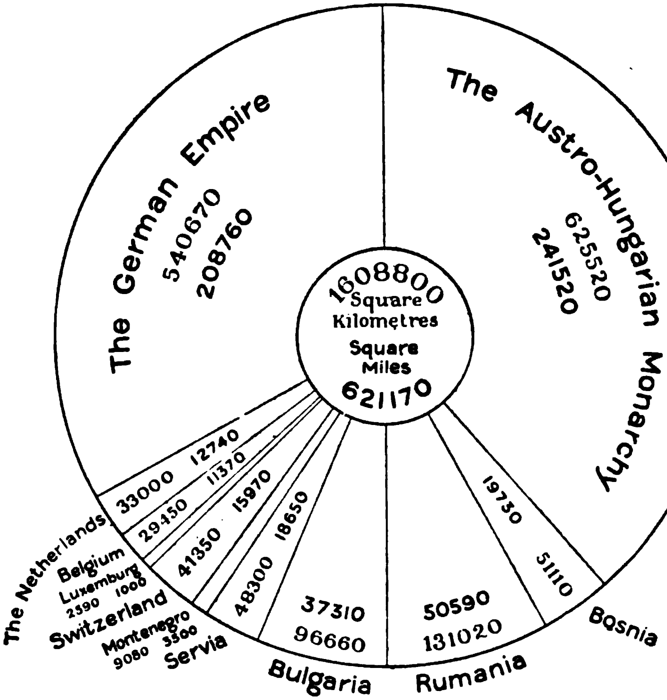

FIG. 26.—Diagram to show Area of States.

Moldavian Boyar, Alexander Kusa, chosen to be Hospodar by the diets of both the countries, was the first Prince of all Roumania. After he was dethroned, Charles the First, a prince of the Catholic line of the Hohenzollerns, was elected to the throne. By the share he took in the Russo-Turkish war, he raised Roumania to complete independence. As a compensation for Bessarabia, which had been taken by Russia, Roumania received the Dobruja, with the port of Constanza. Roumania was recognised as a kingdom in 1881.

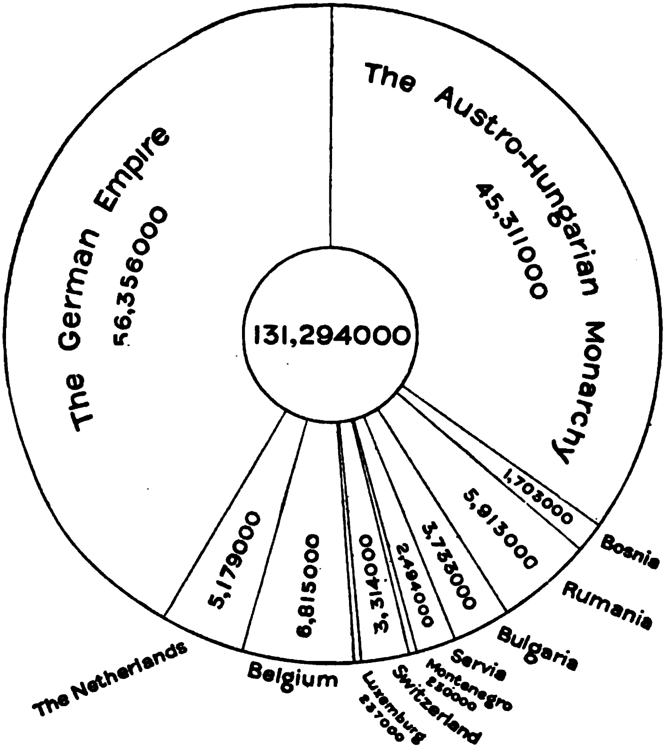

FIG. 27.—Diagram to show Population (A.D. 1900).

The whole system of Central European states is complicated, but not quite devoid of symmetry. Its centre is occupied by two great Powers, each with dominions exceeding 200,000 square miles, the boundaries of whose territories and peoples adjoin so closely that no internal movement of the one can be indifferent to the other; each has an interest inseparable from its own security in the well-being and strength of the other. Both have retained from the days of their closer political association a certain looseness of internal formation. The German Empire is a voluntary association of states competing in their internal development, but forming on the basis of their one nationality a firmly welded unity in matters of defence by land and sea, and of economics and law. The unity of Austro-Hungary is in form more complete, but in fact, owing to the varied admixture of races, less solidly secured. Where the common frontier of the two great Powers ends, at the Lake of Constance, Switzerland, well sheltered by the mountains, lies between them and their great neighbour on the west. The weak copy of Switzerland, the Republic of Cracow, formed between the great Powers in 1815 at the other extremity of their frontier, did not manage to last long; it was swallowed by Austria in 1846. In yet other quarters the two Powers endure a common fate in being shut out by states of moderate size from the mouths of their largest rivers. Compared with the populations of the great Powers, one of which has more than fifty-six millions of inhabitants and the other forty-five, Roumania, Bulgaria, and Servia, which have eleven millions among them, form about an equivalent to the three Netherland states of Holland, Belgium, and Luxemburg. The latter, however, have in every respect a far closer connection with the Central European civilisation than have the states of the Lower Danube. Their remoteness is evidenced by the backwardness of their national education. The independent states on the Lower Danube and those at the mouths of the Rhine, Meuse, and Scheldt have a further point of resemblance, however, in the fact that they are alike subjected to powerful influences from

Powers not situated in Central Europe. As in Belgium, the French element comprises nearly half the population, while French was until recently the dominant political language, thus further increasing the susceptibility of the country to French influences; so in the south-eastern states of Central Europe the will of Russia carries special weight; they are bound to Russia by their remembrance of the Turkish War, by their dependence on the Black Sea, and most of all by the Græco-Oriental Church. The Montenegrin outpost carries this influence of Russia up to the Adriatic Sea.

Even this general glance at the conformation of the Central European group of states leaves no doubt of the direction towards which the eyes of this circle of nations must be turned in watchful attention. France was the most dangerous neighbour as long as its population and strength exceeded those of every other individual power on the Continent. At the present day it stands only on an equal footing with those in the heart of the Continent, and shares with them the feeling that their spheres of power are cramped by the growth of Russian and British imperial power. The old equilibrium of Europe is inclining more and more in favour of the East. The political field has widened. A new equilibrium can only be established if the Powers of Central Europe stand shoulder to shoulder for the maintenance of the free and peaceful economic development which must reach ever farther and farther abroad, as the increasing populations find their homes growing too narrow for them. The belief in a permanent and intimate political agreement among the peoples of Europe would be premature, considering the acute differences which history has bequeathed to them; but the position of the peoples who surround the Alps is such as to warn them imperatively that they should reach their hands across the mountain tops one to another in an economic alliance, for the common safeguarding of their interests, amidst the great Powers of the world.

Note on Authorities.—The territorial development of the States of Central Europe is exhibited by numerous historical atlases; the most important of these, and that upon which most of the others are founded, is K. von Spruner-Menke's *Historisch-Geographischer Hand-Atlas.* Third edition, 1862–1879. 118 sheets.

The development of the States in the last century is set forth in an enlightened and impartial manner by C. Seignobos, *Histoire politique de l'Europe contemporaine*, 1897.

Friedrich Ratzel's *Politische Geographie*, 1897, gives a general idea of the relative stages of civilisation and decay of the various States, considered from a geographical standpoint.

CHAPTER XI

ECONOMIC GEOGRAPHY

ANIMAL AND VEGETABLE LIFE.

BY nature, Central Europe belongs to the great forest-clad region of the earth which extends across 150 degrees of longitude, from the Atlantic to the Sea of Okhotsk. Connected growths of timber once prevailed over far the larger portion of its surface, and would do so again if any great catastrophe came to overwhelm the population of this region, and to leave the powers of nature once more in the ascendant throughout the lands now so highly developed by human cultivation.

From the abundant flora of our meadows and heaths, however, botanists conclude that the forest country can never have been entirely unbroken. Considerable districts of Central Europe must naturally have been free from forest; not only the high regions of all the great mountains—where a shortened period of vegetation and loads of snow and of hoar-frost tend first to stunt, and finally to prevent the growth of trees—but also large lowland tracts, where either too much moisture or too little prevented trees from doing well. The dusty plains of Hungary and Roumania swarmed, even in the time of the ancients, with hordes of mounted nomads; and in the north-west of Germania the Romans came upon a wide domain of moorland, contrasting sharply with the forests of the interior. Even in the forest country great clearings were formed by the river valleys with their boggy grounds that were sometimes green meadows and sometimes alder swamps.

That there were great forests, covering wide areas, amid which lay but scattered oases of human habitation, is declared both by the distribution of archæological remains and by the unequivocal statement of the oldest writers. The thickets of the primeval forests formed a surer protection for German freedom in those days, and of Bohemian independence later on, than did the defensive powers of their brave sons. The course by which different parts of Germany have been won to higher civilisation has been by a constant reduction of the forests, and the echo of that old struggle still lingers in the pleasant names of the German village colonies that rose amid the ancient trees.

Considerable portions of the forests of antiquity still remain in Central Europe. If we exclude from the reckoning those parts where not more than 6 per cent. of the country is woodland, namely 14,000 square miles around the North Sea, 26,000 square miles in the heart of Hungary and an even greater area in Roumania and Bulgaria—some 70,000 square miles in all—then throughout the rest of Central Europe, about a third of the surface is still covered with forests. This territory therefore occupies a middle place between the denuded Mediterranean countries, where the percentage of forest is generally less than 15, and those of the north and east, where it rises in Sweden to 44, in Finland to 38, and in Russia to 36. All the mountains are thickly wooded. Close to rich and populous valleys in the Rhine provinces and Hesse-Nassau lie thick forests that render the district of Wiesbaden and Coblenz the most wooded of the German Empire. In the Böhmer Wald, the eastern Alpine countries, and the Carpathians, are areas of forest occupying 60 per cent., and in the circle of Kimpolung in the Bukovina even 74 per cent., of the face of the country. Great primeval forests are enclosed, too, by the inaccessible mountain country in the trunk of the Balkan peninsula. In the sandy districts of the North German lowland the train runs for hours between silent heaths covered with Scotch firs.

From an extent so great as this, it must inevitably follow that the forest, even at the present day, must exercise a strong influence upon Central European methods of cultivation, and also upon conditions of life and work among the people. The period in which the value of the wood for burning furnishes the only accessible profit, beyond those secondary profits that came from the pasturage of cattle, has not yet expired in every part of Central Europe. In Bosnia, charcoal-burners are still consuming forests apparently inexhaustible. But most of the woodlands of Central Europe have already fallen under the rule of active commerce, which seeks so to deal with them as to transmit the wood, in its most profitable shape, to those places where the price is highest. A great demand for wood and a great supply of wood seldom occur at the same place ; where they do, it is principally in the vicinity of certain mines ; but for the most part the supply and the demand lie far apart and need the mediation of rivers and railways. Large towns, and in particular seaports, are the places that crave most eagerly for wood. The trunks of which were made the piles of Rotterdam, and the ships on which Ruyter and Tromp fought their sea-fights, grew in the Black Forest. The courses, however, of the timber trade have changed in many ways since those times. Nowadays, the harbours of the Rhine delta are full of timber from the Baltic countries, from Norway, and from America ; and twenty-fold more wood goes up-stream to supply the mining districts of the Ruhr, than went down the river from Germany. In general, the increasing tendency to make other uses of water-ways has caused timber rafts to be superseded by vessels. Of the greater rivers, only the Danube, after its entrance into the Austrian Empire, the Vistula, and the Memel have any considerable trade in floated timber. Ease of transport has caused great clearances to be made along the shores of the rivers in the countries of Poland and Lithuania. Whole woods have been floated away from these countries, and the lumber trade of both rivers is now compelled to seek its material far to the south, in the swamps of Rokitno and in the Carpathians. Besides this great trade in rough timber, the endeavour to make the wood as valuable as possible by working it up is always spreading. Manufactories of wood-pulp and cellulose, of impregnated woods for bridges, railway sleepers, and telegraph poles, of wood-paving, shoemakers' pegs, and matches have increased in an astonishing degree during the last twenty or thirty years. This introduction of wood products into international commerce has, in every country, raised the standard of care bestowed upon forests, and has led to far-reaching changes in the forests themselves, their limits, their preservation, even in their possession and the laws relating to them. The forests of Central Europe, as compared with those of the Russian lowland, were particularly rich in deciduous trees. One important cause of this is that the limit of growth of the beech, from the eastern end of the Frische Haff to Kishinev in Bessarabia, everywhere nearly follows the eastern boundary of Central Europe. It can be demonstrated with certainty that deciduous trees formerly occupied a far greater area in Germany than did the conifers—perhaps double the area.

In the North German lowland there has been a remarkable and triumphant advance of the Scotch fir, an advance that has not only been compared with, but has been shown to have a direct relation to, the spread of the Prussian power, which has slowly grown to supremacy over the greater part of that plain. 62 per cent. of its woodlands are now occupied by the Scotch fir, and no less than 43 per cent. of those of the whole German Empire; while in the woods of Austria the fir (*abies*) and the pine, with percentages of 49 and 19 respectively, far exceed the Scotch fir, the percentage of which is but 3. The forests of Hungary are very different. In them, even at the present day, the conifers, with a percentage of 18, fall far behind the beech with its 52, and the oak with its 28 per cent.

With the greater utilisation of the forests, laws have been made for their preservation, and many landlords now enclose their woods like gardens and prosecute any person who sets foot upon them without special permission. The greatest landed properties of Central Europe naturally belong to great forest regions. In Upper Silesia one-fifth of the whole country, an area of 1040 square miles, belongs to seven owners. None of these, however, can be compared, as to extent of possessions, with Count Schönborn-Buchheim, who owns the domain of Munkacs, extending over 513 square miles, or a third part of the County of Bereg, still less with Prince Schwarzenberg, whose property in South-East Bohemia covers 686 square miles. His ancestor was able, as long ago as 1788, to deal with his immense woods like a sovereign by opening a canal 33 miles long to float his timber from the Moldau basin into that of the Danube, and so to bring his domain into touch with the Vienna market.

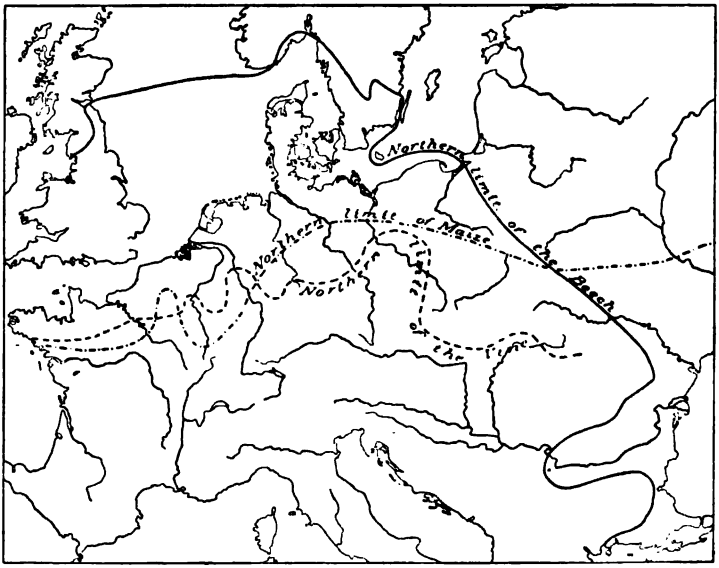

FIG. 28.—Northern Limits of Maize, the Beech, and the Vine.

Great institutions or monasteries have frequently drawn together large forest districts under a common ownership. The benefits that result to agriculture in general, when woods remain upon the mountains and assist in distributing the moisture given out by the atmosphere, has often been pointed out. But there are many areas of forest of which we are compelled to ask ourselves whether they have any right to go on existing where space is beginning to be insufficient for a growing population.

Even in the oldest historical times, the great forests included great stretches of country almost bare of trees. Most of these are marked in the present day by extensive and highly organised cattle-farming. In spite of the advance of agriculture, this branch of industry holds its place in many large areas that vary greatly in nature, but have the one characteristic of presenting obstacles, either in climate or soil, to the success of agriculture. On the south-eastern steppes, the obstacles consist in too little moisture and in too high and too prolonged a summer temperature; in the high districts of the mountains the obstacle lies in too low a temperature. If, in these parts, the steepness, and sometimes the rockiness, of the ground contributes to limit the range of cultivation, the long saturation of the earth does so, no less decidedly, in the marshes and valley bottoms of the lowlands.

Ever since Homer sang of the "horse-milking" nomads on the shores of the Black Sea, mounted peoples have made their home in the steppe countries of Europe. The progress of higher cultivation, however, has so diminished the free spaces where herds of horses could run wild that the Pusta of Hortobagy, near Debreczin, is now, perhaps, the only spot remaining in Central Europe where it is possible to gain some faint idea of the life that once prevailed throughout the whole lowland. Here, on pastures whose area runs to 100 square miles, and amid cattle to the number of 15,000, 4000 horses live under the care of mounted keepers, the Csikoshs. Hungary still remains, notwithstanding the changes of civilisation, the leading country in the matter of horse-breeding. Of the 9½ million horses in Central Europe, 2½ million live within the circle of the Carpathians. Another horse-breeding centre which can compare with

Hungary, not indeed in extent, but in deliberate organisation, and in results that have been tested by modern warfare, is Lithuania, whence come two-thirds of the cavalry mounts of the German army. From Schleswig to East Friesland a strong kind of horse is bred, which is by no means so heavy as the Brabant breed of the Belgian lowlands. What Central Germany has gained in this respect is not so much a gift of nature as the fruit of her own unremitting labour, which has never suffered itself to be daunted by such recurring catastrophes as the Thirty Years' War and the Napoleonic Wars. How different in this respect, as in others, is the position of Britain behind the silver barrier of the sea waves!

Many of the districts in which horse-breeding has grown important have also become competitors in the matter of cattle-farming. But differences of natural conditions have led in this department to a more marked divergence both in aims and in results. In the south-east, from Podolia and Roumania across the Hungarian plain to the Balkan peninsula and over the Italian frontier, the prevalent breed is that of light-grey Eastern European cattle, with narrow heads sloping towards the mouth, long flat foreheads, and horns of considerable length, that bend upwards and twist sideways. These muscular, weather-hardened beasts of the steppe are distinguished by great powers of walking and of drawing loads; they also fatten well, but give little milk. A complete contrast is offered by the cattle of the North Sea district, with their abundant milk supply and small powers of work. Holland has become the model dairy country of Central Europe. Dutch settlements have carried their cattle and their methods not only into districts of nature akin to their own, such as the delta of the Vistula, but also far into the interior. On the reputation of these rested that confidence in Dutch butter which, fifteen years ago, prevailed in the English market. A third type of cattle-farming occurs in the mountains. The high summer pastures are full of nourishing fodder, and the hay harvests of the valleys help to supply food for the active, short-horned Alpine cattle. The cattle industry of the Alps is directed, on the one hand, to the breeding of good milch-cows, a branch pursued especially on the Upper Italian plain, and, on the other, to obtaining abundant supplies of milk, and to the manufacture of cheese in great quantities. The exports of cheese from the Netherlands and Switzerland stand far ahead of those of any other district. The marshes of the North Sea and the valleys of the Alps belong to the districts where cattle are relatively numerous, the number of head of cattle being little, or not at all, less than the population; and their cattle, compared with those of other parts where the same proportion holds, such as the steppes to the south of the Dobruja and the Bosnia mountains, are immeasurably finer and more valuable. The contrary extreme is furnished by Istria and Dalmatia, where there is hardly one horned beast to six inhabitants. The combination of the soil of the Karst and a Mediterranean summer makes the conditions of life most unfavourable. The total number of cattle in the Central European states amounts to between 43 and 44 millions, about one-third of the population.

While cattle serve so many useful purposes, and while the keeping of them comes into touch at so many points with human needs and human labours, the number of pigs, which are needed solely to satisfy the increasing demand for meat, caused by a growing population and by higher standards of life, has risen to nearly 30 millions. The districts where they are most largely kept are immediately adjacent to others in which this branch of farming had been abandoned under the influence of Mahomedanism, and has only recently been resumed. The oak-woods of Servia and North Bosnia are the regions where most swine are bred, and considerable numbers go thence to the important fattening ground of Hungary. In Germany, the district between the last bend of the Elbe and the Upper Ems is especially rich in pigs; Westphalian hams are particularly esteemed. But in other parts, too, the pig is of importance in the households of peasants and tenant farmers. The fattening of swine helps to support the tiny farmsteads that eke out a living around the great properties of the east.

The areas in which there are most swine adjoin those most frequented by another domesticated animal supplying far different needs—the goat. Of the nine and a half millions of goats in Central Europe, three millions and a half inhabit the mountain countries between the Black Sea and the Adriatic. In the Alps their number has been kept down ever since the recognition of the drawbacks arising from the serious damage they do to growing timber.

The same districts that keep many goats retain to the present day the most ancient method of sheep-farming—vast flocks alternating between mountain pastures and lowlands. There is a region running from the middle of Roumania, between the Alt and the Sereth, through the Dobruja, Bulgaria, Servia, and Bosnia, to Dalmatia, in which the number of the sheep exceeds the number of the people. Of the forty-four millions of sheep in Central Europe, eighteen millions belong to this region.

The life of the half-savage wandering shepherds, whose wants are nearly all supplied by their flocks, which yield them milk, cheese, *pastürma* or *postrame* (hard pressed meat dried in the sun and cut into strips), skins, leather, and wool, lingers on into the present like a remnant of the Middle Ages.

Very different were the varied circumstances amid which sheep-farming developed in more highly cultivated countries. In these a great expenditure of capital and of intelligence was devoted, at the close of last century, to the improvement of the breeds, and even under unpropitious conditions of climate, a much improved quality of wool was produced. In recent times, wool-growing has ceased to be remunerative for European breeders working under difficult conditions. Australia, Argentina, and the Cape are the present leaders in this branch of production. The greatly diminished flocks of Central Europe form hardly an eleventh part of the stock upon the earth's surface. When the careful nurture of fine-wool sheep ceased to be profitable, it was superseded by increased breeding of sheep for food. But in this department, too, profits have suffered from severe competition, in which trans-oceanic countries, with their exports of frozen meat, now take part.

That facilitation of intercourse which causes the whole earth to work and feel as a single organism has rendered the position and the condition of life in Central Europe more difficult. This is especially true of agriculture and the industries depending upon it. The plough and the spade rule two-fifths of the area of Central Europe.

Cereals have very long been a possession of Central Europe. In the cavern of Aggtelek (Hungary), a stratum belonging to the later stone age contained not only grains of wheat, but also traces of a slightly leavened bread. Notwithstanding this early cultivation of wheat in Central Europe, oaten bread was the food of the ancient Germani. Barley and wheat they seemed to have considered only as materials for the brewing of beer.

Recent times have seen the advance of wheat into districts formerly occupied by poorer crops. Into this competition between the old native kinds of corn, foreign crops, drawn by travel and discovery from distant homes, entered. Two of these, buckwheat and maize, are now established all over Central Europe. The former appears to have been introduced into Europe from its native Asia by the Tartars. It did not begin to make its way in Central Europe till towards the end of the Middle Ages. Now it is important mainly in two districts lying far apart —the marshlands and heaths of the north-west, from Jutland to the Netherlands, and on the other hand, the south-eastern lands which use this quick ripening crop to draw a second harvest from their once-reaped fields. Along the eastern borders of the Alps, in Styria, Carinthia, and Carniola, wide valley hollows are filled towards the end of the summer by the pale blossom of buckwheat.

A far more important part is played by maize in the south-east of Central Europe. This crop, belonging to the ancient American agriculture of the Incas and the Aztecs, was quick to gain a footing in Europe. As a fodder crop maize also enters into the agriculture of Germany. In the south and east of the Carpathians this is distinctly the main crop, occupying more ground than any other cereal, not only in Roumania, but also in the Bukovina and the south-east of Galicia, along the Upper Pruth. The high summer temperature of this continental district allows it to extend to latitude 49° north in the neighbourhood of Lemberg; but on the west of the Carpathians, where it is extensively cultivated, it does not reach so far north; while not only in Moravia, but also in the plain of Lower Austria, its cultivation falls distinctly behind that of other cereals. In the Austrian Empire its culture preponderates only in Southern Tyrol, in the Alpine foreland of Carniola and in all the

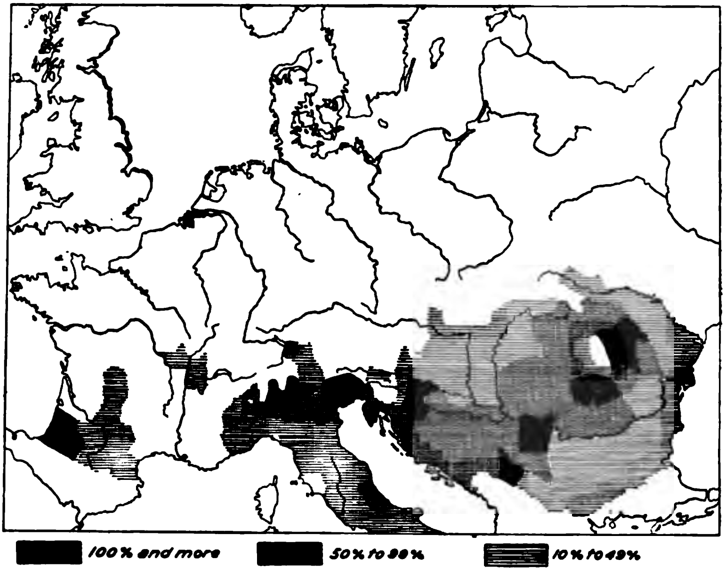

FIG. 29.—The Proportion of Area under Maize to Area under other Cereals.

Karst countries, from Goritz to Dalmatia and Montenegro. In Bosnia it occupies as much ground as wheat, which outstrips it in Bulgaria. On the other hand, maize is the principal crop throughout all Servia and the southern countries of the realm of Hungary from Croatia to Transylvania. On the Hungarian plain it is everywhere grown abundantly, but, except in some divisions to the east of the Theiss, not in excess of wheat. The whole area of maize cultivation in Central Europe is more than 21,000 square miles ; concentrated in one spot, it would cover a space larger than Bohemia.

Hand in hand with the cultivation of maize goes the cultivation of wheat, even in countries where the former predominates and is the food of the population. In those parts wheat is grown principally for export, and only secondarily for home consumption. The whole of Central Europe lies within the zone of growing wheat, the only limits within its borders being set by the level above the sea and the nature of the soil. The rougher heights and poorer soils are most suitable for rye, which is the main breadstuff of Austria and Germany. The proportional areas of wheat and rye grown in Hungary are as three to one; in Austria as one to two; and in the German Empire as one to three. The Hungarian cereal of the plain is entirely wheat, some few tracts excepted, such as that immediately south-east of Pest and that within the bend of the Theiss, where rye predominates. Rye, on the other hand, takes the lead in the Carpathians and also in the greater part of Galicia. In the Alpine countries wheat occupies the first place only in Styria and the northern parts of the Carniola, and among the Sudetic Mountains only in the lowest basin of Bohemia. The whole south-west of the German Empire, as far as the rivers Lech, Neckar, Tauber, and Main, is principally a wheat country, if *triticuma spelta* be included as wheat. In North Germany, however, wheat-fields predominate only in a few favoured tracts, the lowland of Dantzig, some marshes of the North Sea, the fertile plain of Magdeburg as far as Brunswick, the lowest part of the

Thuringian basin, and the cultivated plains of Silesia. Everywhere else rye is the rule. The Netherlands are in the same case. Only the provinces of North and South Holland, and in Belgium those of Brabant, West Flanders, and Hainault grow wheat.

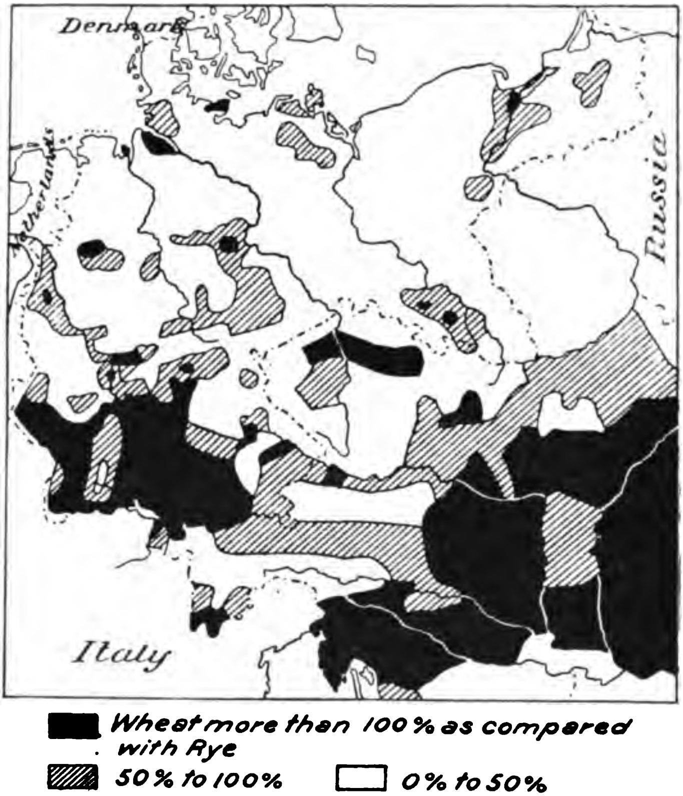
Denmark
Netherlands
Russia
Italy
Wheat more than 100% as compared with Rye
50% to 100%
0% to 50%

FIG. 30.—Proportion of Areas under Wheat and Rye.

Great increases of population have turned into recipients of the alien surplus countries that formerly supplied others from their abundance. As regards Germany, the year 1861 marks the turning-point when exports of rye ceased to exceed the imports, and 1875 the same turning-point for wheat. The demand which has to be met in each country depends not only upon the number of the inhabitants, but also upon the habits and standards of life. How different these are is particularly clearly marked in the case of wheat. Its consumption in Central Europe decreases as we go from south to north and from west to east. Expressed in kilograms per head of population, it reaches the following annual totals. It stands highest in Bulgaria (264), France (246), and Belgium (238). A series with smaller demands is formed by Roumania (171), Servia (95), Austria-Hungary (116), Switzerland (163), and Holland (125). Germany falls far behind, with only 79, but it consumes more rye (122 kilograms per head) and more potatoes.

The total consumption of each country, resulting from these varying averages of demand, is confronted in the different cases by very different powers of production, and these are liable to vary, according to weather, from year to year. Only in the south-eastern countries, Bulgaria, Roumania, Servia, and Hungary is there any great surplus. The wealth of corn in the Lower Danubian countries is the chief basis of their economic position. They have vied with one another to make opportune use of their natural advantages. Like the centres of the trade along the Rhine—Mannheim, Cologne, and Ürdingen—Pest and the Roumanian ports of Galatz and Braila have modelled the organisation of their grain trade upon that of America. Between the years 1881 and 1895—in which period the area of its cultivated land increased by 12 per cent. and of wheat land by 44 per cent.—Hungary rose to the position of one of the greatest centres of the European corn trade. In addition to the organisation of the corn trade, which in Buda-Pest deals annually with a million tons of wheat alone, the position of Hungary in this department has been considerably strengthened by the extraordinary development of flour-mills. Corn from the south of Europe comes into competition with that from over-sea, not only in the harbours of the North Sea, but also in the river towns of Cologne, Frankfort, and

Mannheim, and German agriculture is hard pressed by these intrusive floods of foreign products. This straitened position is a direct consequence of increased international communications, owing to which every increase of production in some distant zone directly affects the European market. The possibility of flooding this market with their products has induced countries beyond the ocean to enlarge their cultivated areas rapidly and extensively. Between 1871 and 1880, the United States, by breaking up large stretches of grass-grown virgin soil, doubled their corn-lands. The same process followed later in Argentina, and, finally, great quantities of Indian wheat flowed into Europe and depressed prices to a point at which wheat

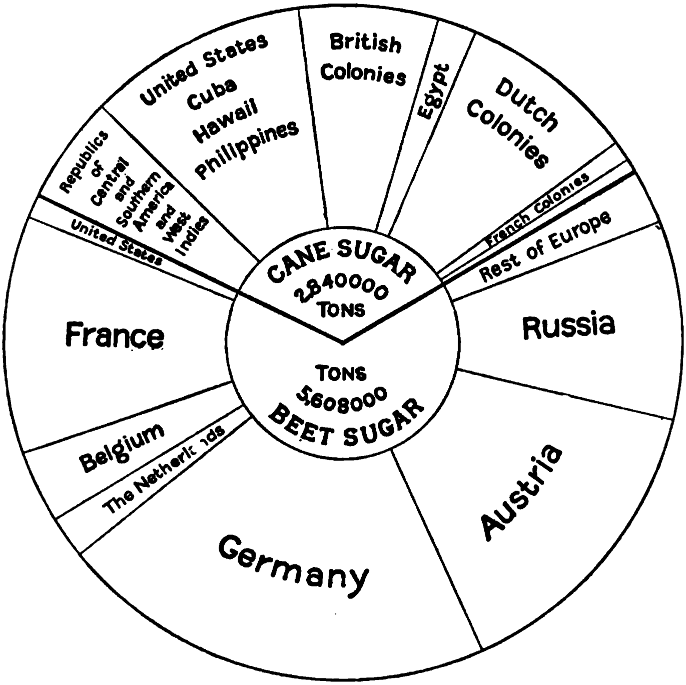

FIG. 31.—The Sugar Production of the World.

culture ceased to be remunerative to the German farmer. This critical development, however, appears to have passed its climax.

Unfortunately, however, the course of the world's advance has raised up other dangers which threaten the cultivation of Central European soil. One department of its manifold activities, the growing of beet and making of sugar, which had been carried to a high point, is directly endangered. The manufacture of beet-sugar, protected by export bounties in the Central European States, rose into importance at the expense of the old cane-sugar from tropical and sub-tropical countries, which, at one time, prevailed throughout the world. In the year 1888 these two main sources of the sugar supply were almost equal, each producing about 2½ millon tons. In 1896–97, however, beet-sugar brought into the markets of the world 4,800,000 tons, and cane-sugar only 2,400,000 tons. This development, attained almost entirely by the exertions of Central Europe, is now suddenly threatened with hindrances and reverses, owing to the appearance on the scene of the United States as a keen competitor. To the old sugar districts of Louisiana, Cuba, and Porto Rico, Hawaii and the Philippines are now being added, lands well adapted to this industry, which was formerly pursued in them with success. In a few years the United States will be the first sugar-producing country of the world, and will be powerful enough to set limits to the sugar trade of other places. The regions most threatened by this alteration of products are the most fertile of Central Germany, around Magdeburg, Central Silesia, and Central Bohemia.

In direct contrast to the sugar-beet, which is confined to the better sort of soils, and usually promises yet further improvement to them through careful tendance, stands the plebeian potato, which grows everywhere. It has been particularly valuable in furnishing food to the inhabitants of districts where the soil is of poor quality and the climate somewhat unkindly. Thus it was fitted for attaining to even greater importance in the northern and north-western portions of Central Europe than maize has attained in the south. The potato occupies over 20,000 square miles in Central Europe, thus resembling maize both in origin and in extent of cultivation. It has not the unlimited capacity of transport that belongs to corn ; it is better fitted for consumption in places not far from the spot where it grows. Potatoes are grown, not exclusively as a food supply, but also as the basis of an important industry of brandy (Fig. 33).

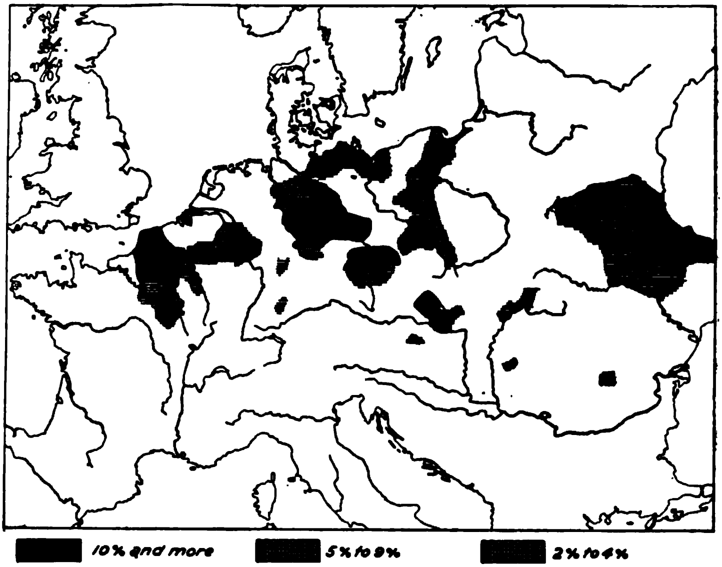

FIG. 32.—Cultivation of Sugar Beet in Central Europe. (After Engelbrecht.)

The two countries best endowed by nature for the preparation of beer are Bavaria and Bohemia. The heart of the Bohemian hop country, 50 square miles in extent, lies in the district between Saaz and Leitmeritz—the tract which also supplies the best barley in Austria. If we then cross the Fichtel Gebirge, we come, in Upper Franconia, near Bamberg, upon the equally extensive German hop-gardens which run along the Main and the Neckar into the Palatinate and Alsace, and along the Altmühl to Upper and Lower Bavaria. The province of Posen, too, has abundant hops, but the main centres of cultivation and sale are in Bohemia and Bavaria. Nearly the fourth part, too, of Germany's barley grows in Bavaria. Upon these essentials rests a vast production of beer. The great activity of manufacture in these districts corresponds to a high rate of consumption (Fig. 34).

The beer countries of Central Europe alternate with wine districts. Measured by superficies, Alsace, Baden, and Würtemberg are the greatest vine-growing districts, containing together considerably the larger part of the whole wine-producing area of Germany, which amounts to 450 square miles; but the best flavoured wines grow more to the north in the Palatinate, Rhenish Hesse, Nassau, and in the Rhine districts along the principal valley of the river, as well as along the Nahe, Moselle, and Ahr. Würzburg on the Main also brings excellent grapes to the vine-press. Far more extensive, but, in general, less valuable, are the vineyards of Austria, of which the larger part lie in Istria and Dalmatia, and only one-sixth in the famous wine

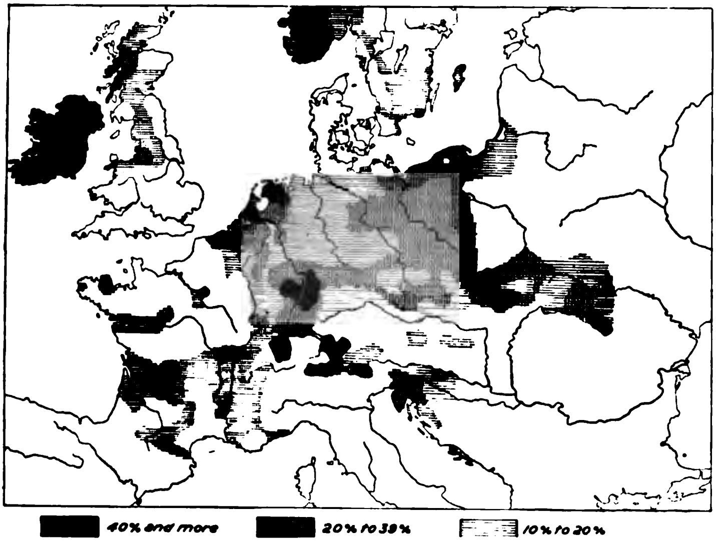

FIG. 33.—Cultivation of Potatoes in Central Europe. (After Engelbrecht.)

district of Lower Austria, while an area still more restricted furnishes the fine varieties belonging to the hot valley of the Adige and the neighbouring valleys of the Southern Tyrol. The highest of reputations has long belonged to the wines of Hungary. But the enchanting girdle of vineyards along the mountainous border of its plains has suffered even more severely than Lower Austria from the devastations of the phylloxera. In 1895, only 857 square miles of Hungary's vineyards were planted, while 424 lay fallow or cleared out. Roumania has extensive vineyards (616 square miles), while Mahommedanism has not diminished vine-growing in Bulgaria and Servia as it has in Bosnia, where it is almost non-existent. The wines of all these countries, however, though they occasionally pass into the hands of French wine merchants to be mixed with other wine, are very far from the perfection which, with care and attention, might be assured to the produce of a climate singularly favourable to the vine. Here, in the lower countries of the Danube, wine is largely drunk by the people, but its predominance at their feasts is shared by the plum-brandy (*slibovitz*). The harvests of Roumanian, Servian, and Bosnian plum plantations are of no less importance in the economy of these countries than are the rich orchards of fruit to the Southern Tyrol, to the mountain border of the Upper Rhine Valley, or to Hungary (Fig. 35).

Central Europe might thus be divided into zones according to the prevailing alcoholic drinks, and the civilisation of each of these zones would undeniably have some special characteristics. No one can fail to perceive that the universal use of wine has had a refining effect upon the low strata of the French population, and has tended to soften the sharp social gradations which, in other places, lead down from wine through beer to potato brandy The wine countries hold an enviable position ; in them even poverty has a more cheerful air than it has in the home of poorer drinks. To Germany these benefits have been given in narrower measure. But perhaps a blessing lay beneath these scantier endowments. Upon the poor soil of the colonised land of East Germany, between the Scotch firs and the potato fields, grew up the powerful race whose fight for freedom dragged Germany from the depth of oppression and founded a solid centre for the slowly ripening national unity.

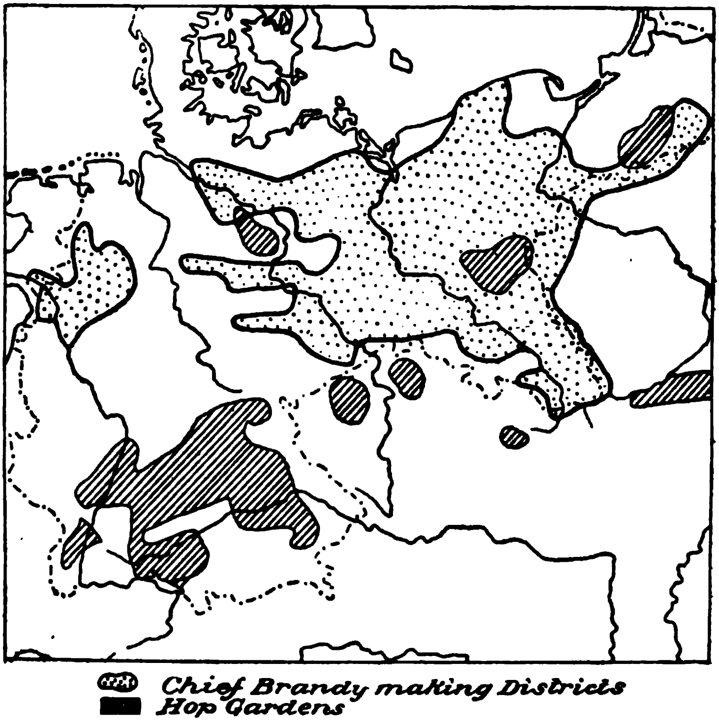

FIG. 34.—Brandy and Beer.

MINERAL PRODUCTS.

In Greek art a wreath of ears adorned the brows of the goddess who gave to men the nourishing fruit of the cornfield. Her name, however, was Demeter—Mother Earth. This name bore witness to the living conviction that the creative power by which vitality is annually renewed resides in the bosom of the earth. The truth of this conviction, indeed, goes much deeper than the meaning of the old myth. In measuring the possibilities afforded by any country to the progress of man, it is not enough to contemplate only the gay and brightly coloured garment of vegetation clothing its surface; we must penetrate also to the deepest and darkest recesses. The treasures that there lie hidden, not only for the advancement of human labour and skill, but also for the securing of human sustenance and comfort, are revealed even by the springs that rise thence to the light of day.

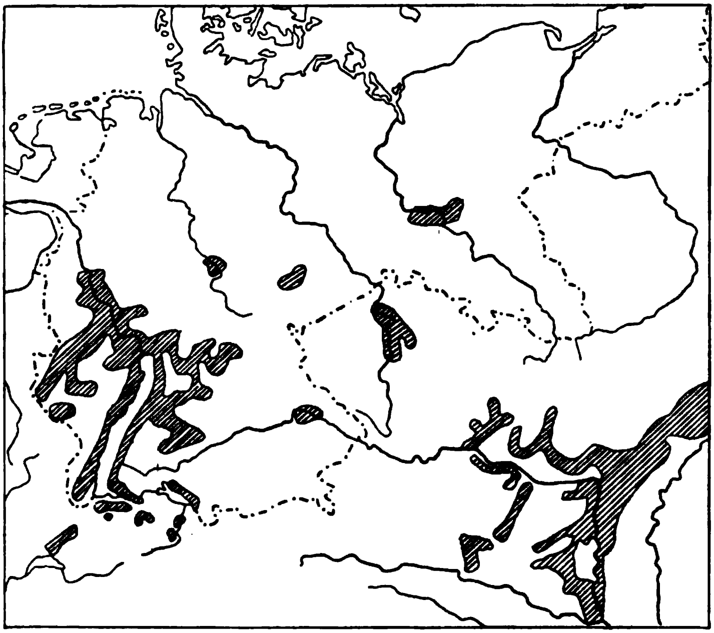

FIG. 35.—Area of Wine Lands.

Hot springs and mineral springs were prized by a vague instinct, akin to a superstitious belief, long before they began to be considered by any scientific investigation. Nor is this to be regretted. It was in this way that a large body of experience came to be accumulated, many facts established, and at least the foundations for further advance in knowledge everywhere laid. Thousands of persons stream every summer with the fullest confidence to springs highly reputed for curative properties, while whole districts find a field of profitable and useful activity in their baths and medicinal springs. It is of no little importance to the prosperity of North-West Bohemia that the springs of Teplitz, Carlsbad, Franzensbad, Marienbad, and many others less important, bring 75,000 visitors to spend some weeks there every summer, and cause the exportation into all parts of the world of millions of bottles of mineral water and many hundred thousand pounds of natural salts. Similar centres of resort, formed by springs, lie in the Taunus and in several valleys of the Carpathians. It is part of the nature of many mineral springs, and especially of hot springs, which are connected with lines of geological cleavage and disturbance, to be particularly likely to occur in scenery of varied outlines. The fresh air and wooded valleys of a mountain range, as well as the pleasantness of the situation, generally help in effecting cures. Comparatively few mineral springs, those mainly that arise from extensive deposits of easily soluble substances lying not far below the surface, occur in flat and uniform places. The brine springs of the Salzkammergut and of Reichenhall, embosomed in delightful Alpine valleys, may be set against the salt springs scattered over the great lowland of North Germany.

Such springs often indicate the presence of salt beds, that may be worked profitably and satisfy a human need which was recognised as urgent by men even in the days when they hunted, kept herds, and fished, but which grew more pressing as they advanced in agriculture. The addition of salt appears to be particularly indispensable to a vegetable diet. The expression "Salt and Bread" marks the lowest demand for food in an agricultural community. The rich endowment of salt beds is therefore an important part of Central Europe's natural wealth. Long before the beginning of historical records, salt was obtained from the Salzberg at Hallstatt by the ancient Illyrian inhabitants, as it was later by the Celts of the Alpine valleys. The innumerable salt springs and inexhaustible salt bed of Transylvania were also unquestionably known and prized at a very early period. The Middle Ages opened up the vast salt bed of the inner and outer Carpathian circles, especially at Wieliczka. But not until our own century was light thrown upon the immense stores of salt hidden beneath the surface of the North German lowland. South and Central Germany had long contented themselves with salt boiled out of the Swabian, Franconian, and Thuringian springs, while in the supply of East Germany, not only Wieliczka, but even the saltpans of the coast of Portugal competed with Thuringia and Lüneburg. Only in recent times has the question of salt been thoroughly and effectually dealt with in North Germany. One boring at Stassfurt shows a deposit of rock-salt from 260 feet below the surface to 4100 feet; and the famous boring at Sperenberg reaches the rock-salt at a depth of 300 feet, and does not come to the end of the vast deposit at a depth of 5080 feet. In the province of Posen, the vast bed of rock-salt at Inowrazlaw supplies the eastern part of the kingdom.

The salt supply of the German Empire not only provides so amply for its own population that in Schleswig-Holstein alone does British salt enter into competition with it; it also supplies large quantities for export. These come principally from the saltworks of Schönebeck and Stassfurt in the basin of Magdeburg, whence the Elbe carries salt upwards to Bohemia and downwards to the sea; from the sea it goes into Holland and Belgium, and considerable quantities are despatched even to British India.

The centre of the German salt industry lies in these deposits of the Magdeburg and Halberstadt basins; which have, however, another special value due to the vast extent and good preservation of a series of strata lying above the bed of pure rock-salt, and consisting of the salts of potash and magnesia, so important to the farmer and manufacturer. The industries supplied by these salts are incomparably more varied than those founded on metallic ores.

In Central Europe gold is only collected in any appreciable quantity in Hungary; the total in 1896 was 3206 kilograms, of which three-fourths came from Transylvania, where the ancient gold diggings have lately been brought into a condition of increased productivity by German capital and German engineers. But, as regards the gold production of the world, which amounts to 425,000 kilograms, Central Europe does not count at all.

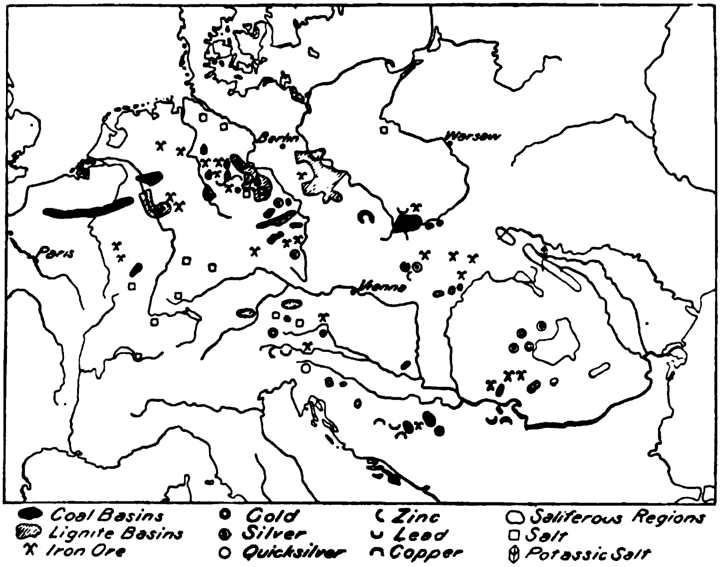
Berlin
Warsaw
Paris
Vienna
Coal Basins
Lignite Basins
Iron Ore
Gold
Silver
Quicksilver
Zinc
Lead
Copper
Saliferous Regions
Salt
Potassic Salt

FIG. 36.—A Mineral Map of Central Europe.

The production of silver touched a higher point. Germany set the pattern for the whole world in the matter of silver-mining, and keen invention had just perfected the processes of smelting, when the far greater output of the extensive American deposits began to press hardly upon German silver mines. That mining for silver can still be carried on at all in Germany and yield a modest profit, in spite of the fact that the value of silver has depreciated by half in the course of forty years, is solely due to a high degree of refinement and to strict economy of labour. But there are years in which no profit at all is gained by the majority of the mines. The silver-mining of Germany is now almost entirely confined to Saxony. Austria gets silver from the old famed mines of Bohemia. The present produce of the once celebrated silver mines of Servia and Bosnia is very small, and there is no prospect of any higher attainment for Central Europe in this branch of mining.

Upon the yield of copper it is possible to reckon more surely. At the present time, indeed, copper is depressed owing to the gigantic production of North America, which doubled its output, and secured the main profit of the unexampled demand that arose with the age of electricity for this electrically conductive metal.

15,000 of the 18,000 tons of copper produced in Central Europe come from the Mansfeld works. This is much less than the annual demand, which amounts, for Central Europe, to about 92,000 tons, and for Germany alone to over 70,000.

There is only one of all the metals in the production of which Central Europe occupies the front rank, and that one is zinc. Of the 400,000 tons produced annually upon the earth, the German Empire supplies 153,000, Belgium 113,000, and Austria 6400. But hardly 7 per cent. of the ore dealt with in the smelting works of Belgium is native; German ore preponderates overwhelmingly. The principal mining places lie together on the Lower Rhine, and again together in Upper Silesia, where the three empires meet, and each claims for itself a part of the metalliferous district. There is a much poorer zinc district in the eastern Alps of Styria and Carniola. These provinces hold a particularly important they contain the only large quicksilver mine, at Idria (5600 kilograms).

Far more important to the economic position of Central Europe, however, is the production of iron, and full advantage has been taken of all the great improvements recently made in the processes of smelting. One of these improvements in particular has been of decisive value, the extraction of phosphorus from the iron by means of the Thomas process, which came into use in 1878. A great part of the iron ore available has only attained its full value since the application of this treatment. This is specially true of Germany's largest deposits, the extensive iron oolites,—the so-called "minette" of the Lorraine plateau, on both sides of the Moselle. Here between Nancy and Luxemburg lies the largest ironstone district of Central Europe. Of the three Powers sharing this domain, France annually brings to the surface, in the department of Meurthe-et-Moselle, above three million tons, and German Lorraine and Luxemburg each above five million tons in the year : more, that is, than is raised in the whole of the remaining territory of the German customs union. Notwithstanding the difficulty of bringing suitable fuel (coke) from the Rhine district and Belgium, German Lorraine and Luxemburg, although they export a large part of their ore to Belgium, France and the districts of the Saar and Ruhr, have also a considerable output of pig-iron. Of the remaining beds of iron scattered through Germany, those of Nassau and others in the north-west of the Hartz Mountains, between the rivers Ocker and Leine, are the most important.

But no single point of the German Empire can compare, as to quantity and quality of iron ore, with that vast Austrian storehouse, the famous metalliferous mountain of Eisenerz in Styria, on the slope of which 300,000 tons of excellent siderite are annually dug, in open workings, from seventeen terraces cut out of a stratum 200 to 400 feet deep. This bed is a link in the chain of iron deposits that may be followed for a long distance through the Eastern Alps. Next to Styria, Bohemia, especially the old sedimentary basin of the interior, furnishes the largest provision of iron to be found in the Austrian half of the empire. Hungary falls but little behind. Of the mineral treasures of Upper Hungary the iron alone appears to have remained up to the present time inexhaustible. It supplies not only the works at Salgo Taryan, but also those of Moravia at Witkowitz. The greatest Hungarian ironworks, however, are in Transylvania, at Vajda Hunyad, south of the Marosh. A suspension railway passing over many valley gorges brings the abundant ore, rich in manganese and free from phosphorus and sulphur, from Gyalar, and also the charcoal for smelting it. These works only make pig-iron, which is sent away to other centres.

These productive iron beds of the Danubian monarchy are now beginning to find competition in the great beds at Varesh in Bosnia, which lie 4000 feet above the sea-level.

Thus, wherever hard rock forms the surface of the land, scarcely any part of Central Europe is entirely without iron ore. The finest beds, however, do not coincide with those of fossil fuels, and the working of iron is more closely bound up with the presence of fuel than with that of ore. Even where the ore is rich it pays better to take it to the coal than to bring the coal to it; and that although improved processes have sensibly diminished the consumption of coal. If coke has to be brought from a distance, the later stages of iron manufacture can only be carried on at a profit in the immediate neighbourhood of the iron bed, if the final operations can be made to follow directly upon the first melting.

The importance of coal and its superiority to other fuels rest upon its combination of high heating capacity with smallness of bulk and weight. These advantages are especially valuable when the object is to produce heat to be transformed, through the agency of steam, into mechanical energy for the service of man. Every step which has tended to establish the superiority in manufacture on a large scale of steam-power to human strength and skill, has also tended to crowd together the heavier industrial processes upon those lands whose surface covers deposits of fossilised fuel. But coal is not only a means of labour; because it is this, it is also a commercial commodity, and that country which can most easily distribute to others its surplus coal gains a commercial advantage. England exports cheaply because she weights the merchant ships that carry her manufactured products with coal instead of with ballast; she imports cheaply because her ships carry coal to the foreign ports whose products they come to fetch.

It is important, therefore, not only to the success of industrial works, but also to the mercantile position of Central Europe, that its northern portion, Belgium and North Germany, forms one of the richest coal districts of the world. To these countries belongs the principal share in the belt of coal deposits that accompanies the outer border of the Mittel Gebirge. Along the northern boundary of the Ardennes and the Lower Rhine plateau the coal measures continue from Belgium to the basin of Aix and the Ruhr district. Following the border of the mountains, we come, in the mountains of the Weser, to the smaller and newer beds of Hanover. The outer edge of the Bohemian group is encircled by the deposits of Saxony, and of Lower Silesia at Waldenburg. A particularly rich coalfield stretches from the eastern end of the Sudetic Mountains across Moravia and Austrian Silesia through Prussian Upper Silesia to Russia and Galicia. In the interior of the Mittel Gebirge are two districts that have extensive coal deposits: Bohemia, which, besides sharing in the Waldenburg bed, includes on the west within its borders considerable deposits of its own, between Pilsen and Bushterad, and the far richer district of the Saar, where the boundaries of Rhenish Prussia, the Palatinate, and Alsace-Lorraine meet. The centre of production lies at Saarbrücken. With its army of half a million workers and its total yearly output of almost 120 millions of tons, Central Europe takes the third place after Great Britain and the United States among the coal-producing divisions of the world.

Important, however, as its treasures of coal must long be, their economic value is determined not exclusively by the quantity and quality of the coal; much also depends upon geographical position; upon whether the coal-beds occur in the immediate neighbourhood of other raw material for the establishment of large works, and whether, on the other hand, a large market for the product of such works lies near, or at least within reach of cheap transport. In both these respects most of the coalfields of Central Europe are more unfavourably situated than those of Great Britain, for except in Belgium and in Westphalia, they all lie at a distance from the sea. The coalfields of the German Empire are dispersed into the farthest corners of its domain, so near the boundaries that a part of the strata sometimes extend into foreign territory. The central parts of North Germany have no other coal measures at command than the modest ones of Saxony.

The drawback of this want of concentration in the position of the German beds of hard coal is mitigated, however, by one great fact, the existence of the most extensive beds of lignite on the Continent. Those of the Brunswick and Magdeburg zone, and of the bay of the lowlands between Halle and Leipzig, assure an invaluable support to the great agricultural and chemical undertakings of the productive countries along the middle Elbe. Their southerly districts, and the manufactures of Dresden in particular, are supplied by the large quantities brought down the river from the lignite district of Bohemia. The foreland of the Alps possesses deposits of value in Upper Austria; so does the interior of the mountains in Styria, Carinthia, and Carniola. In the case of Hungary, too, the place of the old coal measures is supplied by later formations: on the one hand by the liassic beds at Fünfkirchen and the Banat, and on the other hand by the Tertiary coal on the border of the great lowland,

and in the Petrosheny valley at the far south-western corner of Transylvania.

The outer circle of the Carpathians from Galicia to Roumania is poor in solid fossil fuels. These lands, however, have a compensation, for in them are to be found the only mineral oil-springs of any value in Central Europe. From the Poprad to the Pruth dark natural oil appears at many points between the strata of the Carpathian rock, and borings carried out on the Canadian system to a depth of 2000 feet have in some places drawn vast fountains of the valuable fluid from the great underground reservoirs. The most productive wells of petroleum lie in the district of the Dniester, around Drohobycz and Boryslaw. In the same neighbourhood is found the greatest quantity of mineral wax (ozokerit). Roumania has also opened numerous oilpits.

Besides the mineral wealth of various kinds gained by subterranean mining, Central Europe possesses a number of useful stones which are quarried, and of which the unequal distribution necessitates transport. The freestone and marble columns of cathedrals, the slated and tiled roofs of towns, the materials that pave their streets and squares, the vast quantities of lime and cement used in their buildings, all tell of the country's wealth in every kind of building material, and of the labour devoted by generations to making it useful both at home and in far countries. Without attempting to dive into the whirlpool of these unceasing movements, we may just note at this point that some of the substances drawn from the earth of Central Europe possess a rarity that brings them into international commerce, and causes them to travel to the very Antipodes. This is the case not only with the oldest product that was exported from German shores—the amber, that is to say, of the Samland—but also with the lithographic stone of Solnhofen, a well-stratified limestone, superior in fineness and evenness of grain to any other in the world. These two substances represent widely differing periods of civilisation. Remote ages took pleasure in the brightness and transparency of the gum washed out by the waves from the blue earth of the steep shore and cast at the feet of man, a ready-made ornament, but the Solnhofen stone could be prized only by a community that had attained a high state of civilisation. Not what a substance is by nature, but what is made of it by man fixes the value of it. It is time to pass on from the natural foundations of economic life to the active and continuous labours whereby that life is perfected.

HUMAN INDUSTRY.

It is only in the south-eastern countries of Central Europe that primitive methods of production (agriculture, cattle-breeding, forestry, and fishing) still maintain a marked preponderance over other occupations (in Hungary 74, and in Austria 62 per cent.). In Switzerland, on the other hand, the position among the industries of the country held by such employments is only relatively superior, 42 per cent. as compared with 36 per cent. of manufacture and 13 per cent. of commerce. In Germany and Prussia agricultural production and trade have come into equilibrium, each employing 40 per cent. of the population; so they have in Holland, where each accounts for 32 per cent.; while in Saxony manufacture (60 per cent.) forms the main basis of economic life. Here agriculture and kindred employments fall quite into the background, and account for only 18 per cent. of the people's working powers. This is a lower proportion than even in Belgium, where manufacture outstrips agriculture not only in the value of the products, but also in the number of hands employed, though statistics are wanting to furnish a clearer view of their relation. To journey through Central Europe from the mouth of the Danube to the Scheldt is to take a historical survey of several past centuries coexistent in the present day. Towards the end of the nineteenth century the transformation of Central Europe from a region under primitive conditions into an arena of eager industrial activity has been visibly accelerated.

This transition indeed is not equally perceptible in all parts even of the most advanced countries. There are places in which the natural powers are inadequate to the demands of human labour. The wind itself, though the atmospheric tendency to equilibrium causes it to blow for long distances over wide stretches of country, is not everywhere strong enough and constant enough to be counted upon as a regular and trustworthy fellow-worker.

Unlike the shoreless streams of the air, rivers pass through the countries only as narrow bands of living power. And in regard to their employment the claims of productive industry and of traffic used to be irreconcilably opposed to each other. Navigation demanded the freedom of rivers, and industry desired to close them with dams. In general the interests of inter-communication won the day upon easily navigable rivers, and industry was only left unhindered to place her works, like beads upon separated strings, along the upper water-courses where the fall was rapid. The mountain valleys thus came to be filled with water-driven works, the small and divided power being decidedly favourable to marked subdivision of trades. But on large rivers new undertakings for employing water-power in the service of modern industry can be set up but rarely, and only when there is some very special natural fitness. Such was the case with the strong rapids at the town of Schaffhausen, two miles above the Falls of the Rhine. The old water-works, erected in 1860, soon raised the town to a centre of varied industries, but their progress only attained full development after the introduction of electricity for the conveyance of power. A force of 2400 horse-power is now available in the town, and one of 4000 in the aluminium works at the Rhine fall. The civilised countries of Central Europe are rivalling one another in the haste with which they are setting water-power to work, and providing electricity for the lighting of towns, for railways, for machinery, and for electro-chemical works.

The Alpine countries, above all, are making use of the new discovery that in their thundering torrents, their rivers, well supplied even in summer from the melting glaciers, and their vast still lakes, they possess not only an adornment of the landscape but also an inexhaustible storehouse of mechanical energy. Tyrol and the Vorarlberg are very active, but Switzerland holds the first place. The works of Geneva—which will soon be able to put 12,000 horse-power at the disposal of the many trades belonging to a varied and highly refined stage of manufacture—and those of Yverdon—which derive 1800 horse-power from the Orbe, and use it to provide twenty different places with light and energy—are all strongly marked by the characteristic feature of power produced in this way, by the possibility, that is to say, of far-reaching division.

A particularly promising centre of industry will arise at the Iron Gates at Orshova. Only difficulty with Hungary has thus far delayed the utilisation of the river power upon the Servian shore, where an enterprising engineer from Brunswick has made a plan for obtaining 20,000 horse-power, under unusually favourable conditions.

In all this utilisation of the natural force of water, the mountain lands of the Alpine system must in the course of nature take the lion's share. Even in Germany these sources of power are much poorer. Only its Alpine foreland, with the rivers of the mountain country, has any valuable endowment of water-power. The rapids of the Rhine at Rheinfelden, and the rivers Lech and Isar offer power on a large scale suitable for the establishment of electrical works. Munich alone among the great towns of this continent has an opportunity offered it, by the delightful fall of the foaming Isar, of developing mighty electric powers. Everything offered by the rivers of the Mittel Gebirge falls very far behind. Even the Lauffen rapids (at Heilbronn) are famed in the history of electrical distribution only because from them the first attempt was made to apply electric power at a distance, the power supplied by the falls of the Neckar being used in 1891 for an exhibition installation at Frankfort on the Main, 110 miles away. Projects for making rivers with less fall available by means of large dams are not wanting, although the difficulties of such undertakings threaten to outweigh the advantages.

The northern part of Central Europe must try to console itself by remembering that it is richer in another source of power: in treasures of fossil fuel. In the present day coal still has the first voice in deciding the local distribution and practical shape of industrial life. And while the possibility of transmitting the electric current to a distance lessens the dependence of industry upon the spot where the power is generated, fuel is susceptible of no such cheap and easy removal.

The limits of a coalfield are therefore in general but little smaller than those of the trade directly called into existence by it, and of the denser population to which this in turn gives rise. Typical examples of these fields of intensified labour are furnished by the following industrial districts of Central Europe: that of Hainault (Mons-Charleroi); that of Liège and Aix; that of the Lower Rhine, Wupper, and Ruhr; the basin of the Saar; the district of Chemnitz and Zwickau; that of Upper Silesia, and that of Bohemia. Certain characteristics are common to all of them, and impress themselves irresistibly upon the general aspect and upon social life, in spite of the great natural differences existing between the fertile valley of the Meuse, the intersected tablelands at the northern foot of the Erz Gebirge, and the melancholy woods of Scotch fir that border the sluggish watercourses of the Russian frontier.

The most striking feature is everywhere a rapidly advancing increase in population, arising since the middle of the nineteenth century, and filling whole districts so thickly that in some places there are 1000 and even 2000 inhabitants to the square mile. In places where formerly stood little hamlets of only a few houses great townships of 20,000 to 50,000 inhabitants have sprung up like mushrooms within the last two or three decades. Real towns, however, they are not. Their irregular boundaries, the absence of enclosure, their casual unplanned growth, all show a lack of completion, and a glance suffices to tell us with what difficulty this conglomeration of mines, foundries, factories, and worker-colonies manages to meet the sudden onset of so many varying demands. A single generation has to undertake the supply of water, canals, lighting, paving, schools, and churches, things which in a quietly growing town arise gradually, and of which the cost is spread easily over a course of centuries. Industry itself shows kindred features in these regions. Large concerns and great capitals dominate; regiments of workers obey either joint-stock companies or industrial kings. Some of the latter are the old landlords, whose slackened sails received a fresh wind from the sudden rise of industrialism, while some have worked their way up from among the heroes of labour.

As in the methods of industry, so in the choice of its field, a certain similarity prevails in all the great industrial districts. A widely ramifying iron trade everywhere occupies the first place, and supplies every branch of life, of labour, and of communication, with tools, machines, railways, and conveyance, while it furnishes weapons and defensive material for the national protection. To this trade, which attains in Central Europe the highest point of diversity and of efficiency, belong the largest workshops of the Continent. The most extreme example—which, however, is but an example—of the development of manufacture on a large scale in the coalfields of Central Europe, is furnished by the Krupp cast-steel works at Essen, where 23,000 workpeople are employed, and which provide a livelihood for 80,000 souls.

In Upper Silesia, as in Belgium, zincworks and leadworks have been placed near to ironworks. Chemical works, too, are frequently established near to the iron forges, for ever since so much care has been devoted to obtaining and utilising the secondary products of the smelting process, they have been very closely connected with them. Among the various products of chemical industry in which Germany has won a leading position, aniline dyes, obtained from coal tar, take a high place. The use of vegetable and metallic dyes has been greatly restricted by these. Not infrequently these coal-tar colours are successfully applied in the immediate vicinity of the land from which their raw material was dug. In many coal-fields a considerable manufacture of textiles has arisen, generally carried on, however, a little outside the sooty atmosphere of the furnaces. Nearly all the conspicuous trade centres have their textile satellites.

The coal-beds of Central Europe, including the larger lignite deposits, may thus be indicated as the main seats of its labour and manufacture, far surpassing in number and in the value of their products those works which are dependent upon water-power. Trade, however, depends not only upon the powers afforded by nature in the way of moving water or heat production; it depends in no less a degree upon the accumulation of the various raw materials destined to undergo changes and improvements. For this reason other trade centres adjoin themselves preferably to large nuclei of traffic. Large towns are the foci in which are gathered together the economic treasures and powers of a wide district; while, on the other hand, the demands arising from the needs of a whole community also concentrate themselves, and are in a position to call forth the echo of labours answering to their wants. Because of these things, and of the accumulation of raw material even from very remote places, an enormous variety of industrial activities are set free, the variety of which is but very imperfectly apprehended, not only by chance visitors to a great town, whose impressions are naturally hasty and superficial, but also by the majority of the townspeople themselves. The particular merit of urban industry lies less in the bulk of material dealt with than in extreme finish and refinement of its execution, and in the combination of products arising from several simple processes into complex products, which both correspond to the heightened wants and satisfy the tastes of a civilised society. It is a special privilege of cities to be centres of a nation's intellectual life; all the various branches of commerce directly subserving it reach their highest perfection in towns, and some of them assume international importance.

In the immeasurable empire of productive labour, every city chooses its different province, according to external circumstances or to the tastes and aptitudes of its inhabitants. This choice decides the individual character—one might almost say, the personality—of the city. If we consider that Central Europe contains two metropolises each having more than one and a half million inhabitants, and that in the fifty-three towns whose population exceeds 100,000 there are more than 15,000,000 persons, or a ninth part of all the inhabitants of the region, while that of these fifty-three towns only ten, and those some of the less important, have arisen in or very near to coal-fields, we shall admit that the development of urban life, in the great commercial centres is a considerable and direct cause of industrial activity.

Not all industries, however, arise from positive natural aptitudes. Not wealth alone, but also poverty is a cause of production. It is so with the domestic industries in the mountains of Central Europe, the weaving villages of the Rhön and the Sudetic Mountains, the bobbin-lace and embroideries of the Erz Gebirge, Appenzell, and Flanders, the toy manufacture of Thuringia, the watchmaking of the Black Forest and the Jura, and the wire-drawing among the Slovaks of Upper Hungary. However different the state of these industries, some of which are happily flourishing, while others are hopelessly decaying—the majority do but very barely maintain their existence—they all have this in common: that they owe their growth not to the stimulus of any valuable natural gift which invited utilisation, but to that lack of natural resources in absolutely poor or relatively over-populated parts by which an industrial people, satisfied with moderate returns for labour, were driven to seek some occupation, and to attain a high degree of skill and dexterity in it. There is a future only for such branches as can reap some advantage from the progress around them, and adopting the services of machinery and of the modern supply of power can restrict handwork to those departments which demand intelligent skill or artistic sense of beauty, into which mechanical power can never force its conquering way. The materials wrought up by these domestic industries are generally of small value, and obtained in the immediate neighbourhood of the worker; but sometimes an industry will maintain itself out of the beaten tracks of larger trades, drawing its material from long distances, sending out its products into all parts of the world, and having nothing on the spot but intelligence, training, and industry. One instance may suffice. At Ruhla, in the Thuringian Forest, there is a flourishing manufacture of pipes and cigar-holders; it imports meerschaum from Asia Minor, amber from the Baltic, cherry wood from Lower Austria, brass plates from Augsburg, rosin from India, cedar wood from the Lebanon, and birch wood from Sweden.

This is a triumph of labour, and we may well be set thinking, when we find a manufacture like this, far inland, with so little material foundation and no support from the forces of nature, coming into rank with those that draw their raw material from abroad. The larger branches of industry in Central Europe do so on a much larger scale. In regard to the metal trades this fact has already been pointed out. Not only tin, of which practically none exists in Central Europe, and copper are imported in very great quantities, but in the interchange of iron ores and pig iron the imports far outweigh the exported surplus. Particularly varied are the materials imported to serve the needs of the great chemical industries. In trades that deal with fats and oil the old native materials have been superseded in a striking degree by tropical products. Textile industries, too, make a large demand upon imported material, and that even in departments in which Central Europe used formerly to be self-sufficing. Its trade in flax, hemp, and wool, which about the middle of the century was centrifugal in distribution, has become completely centripetal, and seeks supplies from great distances. The production of silk, originally foreign to this region, has in course of time undergone displacement A zone of silkworm farming, silk production, and silk spinning has arisen in Southern Europe. The industry has spread from Italy into the Southern Tyrol and Ticino; and to the north of this zone begins a belt of silk weaving, widest in France, but continuing into Switzerland and along the Lower Rhine. Far more general in its extent and more important, as occupying a far larger part of the population, is the manufacture of cotton, all the raw material of which comes from over-seas. Between 400,000 and 450,000 tons of raw cotton are imported in the course of a year by Central Europe. The principal seats of this trade are in the Rhine districts—North Switzerland, Upper Alsace, and the industrial regions of the Lower Rhine—and, farther to the east, in Würtemberg, Saxony, and North Bohemia. A companion industry, likewise resting entirely upon imported raw material, and rising rapidly into importance, is the manufacture of jute.

The greatest change which has arisen during the last decades in the relation of the progressive countries of Central Europe to the rest of the world lies in the unusually great increase in the importation of foreign raw materials. This is too great to be explained merely by the concurrent increase of population. Far rather does it mainly indicate a rise in demands on life, in the standard of living, and in the material progress of the nations. Central Europe has become more dependent upon foreign countries, not only for food, but also for the supply of other most important necessaries of life. It goes without saying that this relation to foreign countries beyond the sea cannot consist only in a one-sided importation of their products, but that there must be a corresponding increase in the exportation of Central European manufactures. The greater part of Central Europe has already reached that phase of development in which agriculture no longer occupies the first place as a basis of the social life of the people, but has been in great part superseded by industrial activities which must necessarily seek a market for their products beyond their own borders.

The great impulse received by German industrialism in the last fifteen years is a matter of common knowledge. Between the census of occupations taken in 1882 and that taken in 1895 the number of persons engaged in industrial callings had increased by 29½ per cent. During that time the total imports of the Empire—if we take the average of the three years from 1882–84 and the three from 1895–97, so as to exclude temporary variations—had risen 41½ per cent., though the importation of foreign manufactured goods had diminished by 12 per cent. But the export of German manufactured goods, too, shows a slight *decrease* in value, from 2304 to 2262 million marks, or 2 per cent.! Surprising as this result may appear, it places beyond all question the fact that the recent increase in German manufacture is absorbed in great measure by the increased consumption of the German people, among whom not only the actual numbers, but also the standards of life have risen considerably. If this is so, the balance of imports over exports in the German Empire must tend more and more towards a preponderance of imports. And this is actually the case. While in 1882–84 the exports were still equal to 97 per cent. of the imports, in 1895–97 they equalled only 80 per cent. Germany shares this condition with many countries of high economic development. In those of Central Europe the annual sums of import and export (precious metals excluded), stated in millions of the current coin of each country, were, according to the latest figures (1900), as follows:—

	Imports.	Exports.
German Customs Union	5765.6	4611.4 (marks)
Holland	1950.2	1690.9 (gulden)
Belgium	2215.8	1922.9 (francs)
Switzerland	1111.1	836.1 (francs)

This would formerly have been esteemed an "unfavourable" balance. But no one in the present day will consider that the annual economic totals of these countries indicate a worse position than that of Austria-Hungary, Servia, or Bulgaria, in all of which countries the exports exceed the imports. The revenue of a country is powerfully affected by other items, especially the return upon capital invested abroad, the freights of internal and external commerce, and the sums set in motion by travel.

The smaller the states of Central Europe the more surely are their population destined to follow in their turn the path which England in particular has trodden with so much success, and to employ their capital not solely in the overcrowded labour market of their own homes, but also to make use of a considerable part of it in foreign and trans-oceanic countries.

We should greatly underrate the economic importance of Central Europe if we held our attention concentrated upon what goes on within its boundaries. It is true that, of all its states, Holland alone has colonial possessions bringing in really abundant profits; the future must decide the results of the efforts being made in this direction by Belgium and Germany. Far greater is the work carried on under foreign rule by the enterprising financiers and pioneers of civilisation belonging to these two countries and to Switzerland, in plantations, mines, factories, railway building, and merchant shipping.

To try and show this in detail would be to circumnavigate the earth. It lies in the nature of things that this wholesale activity cannot be brought under exact statistical statement. The desire of gaining some approximate notion of it may be satisfied by a glance at the trustworthy figures, lately made public, that deal with the foreign business activities of one country, the German Empire. The possessions of its inhabitants in foreign funds are given at twelve and a half milliards of marks. The annual freight dues upon sea-carriage exceed 200 millions. The total amount of other capital employed beyond the national boundaries in various undertakings cannot be less than seven milliards of marks. There is hardly a country of the world where capital and intelligence from Central Europe do not take a large share in industrial competition. A superficial glance at the renewed activity and eager competition prevailing among the struggling and progressive nations of the world, and at the spread of this competition into every corner of available land, may well give the impression that differences between nations and the dangers arising from such differences are becoming more acute. Probably the precise contrary is true. Every new milliard which any country takes into a foreign part strengthens the interests of peaceful labour as against the violent inclinations by which politicians are so apt to be led astray. The closer and firmer the links in which nations are drawn together by common business relations, the more earnestly does sound and growing enlightenment insist upon the first condition of successful labour—peace.

Note on Authorities.—The natural conditions, historical development, and present physiognomy of native vegetation are set forth in handbooks of botanical geography by Grisebach, Drude, Warming, and Schimper. An excellent general view of plants under cultivation is presented by Theodore H. Engelbrecht's *Die Landbauzonen aer aussertropischen Länder*, 3 vols., 1899, a work rich in statistical details. A map of viticulture has been drawn by W. Hamm, the author of the learned *Weinbuch*, third edition, 1886.

Maps of the mineral treasures are to be found in the *Physicalisch-Statistischen Atlas des Deutschen Reiches*, by R. Andree and O. Peschel, 1878; and in the corresponding atlas of Austria-Hungary, by J. Chavanne, 1887

CHAPTER XII

THE ALPINE COUNTRIES

SWITZERLAND.

The mighty war-tempests of the seventeenth and eighteenth centuries rolled past the Swiss Federation without hurting it. The mountaineers could only satisfy their warlike impulses by taking voluntary service as mercenaries, generally under the French flag. When, after the time of Napoleon, the European states settled again into equilibrium, the quietest spot was once more assigned to Switzerland. The great Powers guaranteed her neutrality. Switzerland did well, however, not to let her independence rest entirely upon the will of her neighbours, but to draw her twenty-two cantons (now twenty-five) into closer union, and to fit herself for defence. She is not compelled, however, to make any very great exertions for her own security, but can devote her strength, unthreatened and undisturbed, to developing the aptitudes of her people. Her internal commotions are no more than teacup storms; the nationalities united within her borders—71 per cent. of Germans and 22 per cent. of French—offer to all Central Europe a fine example of how to dwell together in unity.

In all the works of peace Switzerland takes a high place. In public education, in scientific investigation of their lovely country's nature, in the representation of its surface by maps of extraordinary excellence, in the conflict with the wild forces of nature by ruling the paths of avalanches and the beds of torrents, in the planting of desolate mountain slopes, and the regulation of neglected rivers, the Swiss are ahead of all their neighbours. Switzerland is a rich country, not by nature, but entirely owing to the diligence of its inhabitants. It possesses no great quantity of ores or of fuel. Salt alone is yielded abundantly by the works of Bex, Rheinfelden, and Schweizerhall. Of the total surface of the country (16,000 square miles) fully 28 per cent. is rendered useless to man by watercourses, glaciers, rocks, and detritus ; while even in the remaining parts the climate and the soil prevent labour from obtaining a full return. Of the 72 per cent. of the country reckoned as a productive area, 20 per cent. is occupied by forests, and certainly more than 30 by meadows and pastures, scarcely 20 by arable land, orchards, and gardens. The activities of Swiss farming have for many years past been more and more directed towards the rearing of cattle, while agriculture has been less and less followed. The harvests of the country, therefore, do not nearly supply the demands of the population and of the vast numbers of foreign visitors. Although the magnificent cattle that give life to all the high pastures of the Alps, and especially to the meadows of Appenzell, the Grisons, the three original cantons, and Fribourg, furnish exports of milk-produce to the value of 70,000,000 francs, yet these are counterbalanced by imports of food to four or five times this value, consisting chiefly of agricultural produce, meat, and also alcoholic beverages. Thus that portion of the country's economic power which has any external effect runs principally in industrial channels. Manufactures occupy almost the same number of the population as agriculture. The lack of coal, which has to be imported from the Saar district, is in some measure compensated by the abundance of water-power. Water-power gives its support to the cotton trade of North-East Switzerland. But even in the textile industries, the lace and embroidery of Appenzell and St. Gallen, and the silk trade of Basle and Zürich, the raw material of which comes by way of the St. Gothard from Italy, the principal factor of success is that diligence and skill on the part of the workers which attain their fullest triumph in the watch manufacture of the Jura and the jewellery work of Geneva. The textile industries of Switzerland contribute more than 415,000,000 francs to the exports of the country, and watchmaking 123,000,000 francs. The total, however, remains far behind that of the imports. Among the contributory sources of wealth by which this large commercial deficit is counterbalanced in a country whose prosperity is notorious, must be reckoned the vast consumption arising from the influx of foreigners.

The natural beauties of a high mountain country, so despised in former times, are now so much esteemed, that they assume the value of an indestructible capital, from which the industrious inhabitants are always busy in drawing the interest.

If we were obliged to name a centre of this busy life, we should find our task difficult. Not only the federal constitution of Switzerland, but even the nature of the country impedes the pulsation of all its life from one heart, and tends rather to the development of several independent and competing centres of intellectual and material exchange. The position of these is evidently fixed by the attractive power of the roads that connect the country with the exterior world. Geneva, at the lower end of Lake Leman, where the Rhone flows out on its way to the southern gate of the Jura, is beyond question the capital of French Switzerland. Judging by situation, the corresponding place in North Switzerland would be Constance, which indeed strove in the Middle Ages towards a leading position. But after the Federation separated from the Empire, the interests of Constance became antagonistic to those of Switzerland, and it consequently lost not only its territory, but also the beginnings of commercial prosperity. Switzerland found compensation for the lack of this place by stretching beyond her natural boundaries on the one hand to Schaffhausen across the Rhine, and on the other to Basle beyond the Jura. The former gives a passage into Swabia, while Basle commands the communications to the valley of the Upper Rhine and into Burgundy. But the northern outlets of Switzerland, so different from the simple opening of the Rhone, have always tended to throw the northern centre of Switzerland somewhat backwards towards a gathering place in the interior. The old Romans chose Vindonissa on the Aar, near to the junction of the Reuss and the Limmat at the foot of the heights which carry the Habsburg. This convergence of valleys promised more than it fulfilled. It leads on the north, not to an open exit, but to the broad southern slope of the Black Forest. These mountains, closing the valley road of Central Switzerland, largely conduced towards the independence of Switzerland by favouring its separation from Germany. In ancient times they must have checked the development of traffic at Vindonissa. Modern times have succeeded better in the choice of Zürich, more to the east, as the centre of traffic. Here the natural road from Geneva to Berne, crossing the outflow of the Lake of Zürich, meets not only the line from Chur to Basle, but also the St. Gothard line. Their junction and the division of the traffic towards the towns on the Lake of Constance, towards Schaffhausen and towards Basle, which takes place here, secure to Zürich, which is fast becoming the chief of Switzerland's large towns, an inalienable superiority over Berne. The central position of Berne marks the proper seat of the Federal Government. As a centre of traffic it would not be equal to Zürich, even if a tunnel through the Bernese Oberland (Lötschen Pass) should succeed in connecting it with the Simplon. For the principal traffic of this pass would, even then, not touch Berne, but go to its destination by way of Lausanne, which aims at taking the same place as a meeting-point of traffic behind Geneva that Zürich takes behind Basle.

All the little centres stand considerably behind the towns which have been mentioned. The modest prosperity of Neuchatel is closely limited by the Jura and the lake. Lucerne dominates only the beautiful little world of its own lake, and Chur the passes of the Grisons, which have become less frequented. As seats of modern industry, both the watchmaking-town of La Chaux de Fonds and the old St. Gallen have risen into importance. On the other side of the Alps, and leading into quite another world, lies Lugano, the most southerly outpost of Switzerland, hidden among gardens whose mountains are mirrored in a warm lake.

THE ALPINE COUNTRIES OF AUSTRIA.

As we advance farther towards the east the Alps become less important. The summits of the mountains sink to a lower altitude, the passes become easier, the great valleys grow wider and more hospitable, while the absolutely unproductive part, which in Valais and Uri occupied more than half the area, not much less in the Grisons, and a third even in Ticino, shrinks to less than a fifth as soon as we come to Tyrol and Salzburg, and in Styria and Upper Austria is less than a tenth. These increasing tracts of productive land are occupied by grass only in those districts which lie near to Switzerland, and compete with it in cattle-farming, such as the Vorarlberg and the Bavarian Allgäu. In all the other parts of the eastern Alps forest covers the greater part of the country, and, taking all the Alpine districts of Austria together, occupies 39 per cent. of the whole area. The prosperous days of gold-mining in the Tauern, and of silver and copper mining at Schwaz, in the lower valley of the Inn, belong indeed to the past, but Salzburg still yields copper, Carinthia lead and zinc, Carniola not only zinc, but also quicksilver from Idria, while the iron mountain of Eisenerz is superior to all other mines in the Alpine countries. Antiquity praised the "Noric blade," and still older may be the salt mines of the Salzkammergut, famous for the archæological discoveries of Hallstadt. The old salt-mines at Aussee, Hallstadt, Ischl, Hallein, and Hall (in the Tyrol), are still worked, but the salt streams which came from the salt-beds, and of which the evaporation yielded coarse salt, were carried down—as soon as the fuel of the immediate neighbourhood had been consumed—in long loops to distant woodlands. Thus the salt-spring of Hallstadt and Ischl goes down to Ebensee; that of Berchtesgaden, in the Bavarian portion of the same salt-bed which near Hallein belongs to Austria, is carried over a high pass to Reichenhall, and even farther on, by way of Traunstein to Rosenheim on the Inn, where, besides the wood of considerable forests, the peat of a large bog lies ready to be used in the evaporating of the salt.

The hills of the Alpine foreland, especially the Hausruck, as well as the valley districts of the rivers Inn, Drave, Mur, Save, and Sann, possess excellent beds of lignite, the richest of these being in Styria, along the western border of the basin of Graz. The neighbourhood of this deposit, and that of Leoben, lightens the pressure of competition from northern ironworks to which Styria has been exposed since improved modern processes of smelting, by rendering possible and profitable the forging of phosphates of iron, deprived Styrian iron of the superiority which it enjoyed in being free from phosphorus.

Mining in its various shapes has had a great influence in drawing settlers to the valleys of the Eastern Alps, and still gives employment to a considerable part of the population. The districts specially favoured by climate, the Rhine Valley and the valleys of Southern Tyrol, are most thickly peopled. In the Vorarlberg spinning and embroidery are carried on, as well as agriculture and horticulture, successfully modelled upon those of Switzerland ; in Italian Tyrol, as in Lombardy, many busy hands are employed in the breeding of silkworms. But, in all these districts, the essential feature of economic life lies in the high cultivation of the land. Mulberry trees stand in rows along the edges or down the middle of the fields ; between them swing the garlands of the vine, and the same field will here be seen to bear maize for polenta, wine to gladden the heart of rich and poor alike, and mulberry leaves for the silkworm. But the population has already outgrown the country's resources, and numbers of industrious workers from Italian Tyrol are seeking their bread in foreign countries. Farther north, in the German portion of Southern Tyrol, where silk-breeding disappears, fruit culture takes its place beside the vine culture, whose cheerful verdure fills all the hollows about Bozen, and many a neat village draws a rich return from the loads of apples, nuts, and chestnuts which it sends abroad. These favoured valleys of Southern Tyrol attract a large proportion of the crowd of tourists whom the charm of the mountains draws to the Eastern Alps. The mountain lover must not look, in the high valleys of the Austrian Alps, for the invariable comfort and luxuriousness of a Swiss hotel; nor will he find a net of railings running round those mountain peaks that afford the finest views; but, wherever he goes, he will soon feel at home among a kind-hearted people.

The point at which the Brenner line runs into the longitudinal valley of the Inn and joins the Arlberg line is naturally the site of the capital of the country, Innsbruck, situated upon the plane of a broad shallow valley. To the south of the Brenner no one centre reunites the advantages possessed by Innsbruck. Franzensfeste is the point of junction of railways; Brixen is the bishopric; at Bozen the rivers meet, and Meran is the terminus of the mediæval road over the Brenner, which avoiding the difficult gorges of the Eisack valley, diverged at Sterzing, and came over the Jaufen. At that period the castle of Tyrol, above Meran, was a feudal seat well fitted to impress its name upon the whole country. Trient, the capital of Italian Tyrol, which is inferior to none of these four places, is the dividing point of the roads to Venice, Verona, and Brescia.

Farther east the Hohen Tauern divide the provinces of Salzburg and Carinthia, each of which can communicate easily with Tyrol, but not so easily with the other. Beautiful Salzburg, in its character of doorway to Tyrol, assumes increased importance from the fact that the Inn, when it emerges from the mountains, is no longer in Austrian territory. Klagenfurt, the capital of Carinthia, lies in a quieter place, and is more distinctly a town of the interior of the Alps. Its basin has beauties of scenery that far surpass the boggy plain of Laibach, the capital of Carniola, but cannot altogether compare with it as a centre of traffic. The railway from Trieste now carries the traffic of the Mediterranean districts that once went by the busy Roman road between Aquileia and Nauportus. While the ancient road went up the Save and along it into the Hungarian lowland, the modern one turns very decidedly northward towards Styria.

The Styrian capital, Gräz, owes its existence, its name, and a part of the beauty of its landscape to the steep mountain, crowned by a castle, that rises in a picturesque promontory from the broad valley of the Mur. But the size and the importance of the town were decided by its position at the outlet of the Mur into the basin of Gräz. At this point the road into the Raab valley, going on into the heart of Hungary, branches off to the east from the River Mur, which guides the course another road in the direction to the Adriatic. From the west lignite pours into the town from the neighbouring beds and enables it to take part in the forging of Styrian iron, and to enter upon many branches of manufacture.

Two easy approaches give access from the south to the inner longitudinal valley of Styria, from the two ends of which the rivers Mur and Mürz flow to meet each other, that of the lower valley of the Mur from Gräz, and the low pass of Neumarkt from the basin of Klagenfurt. To the north two corresponding outlets open towards the northern border of the Alps. The more westerly of these goes across the low Schober Pass to the Enns, and follows that river up to its junction with the Danube, whence it continues northward into Bohemia; near the southern entrance of that country lies Linz, the capital of Upper or Western Austria. The Semmering railway, on the other hand, goes north-eastward from the Mürz to the largest town of the whole Alpine country.

VIENNA.

The basin of Vienna is the only break in the great curve of the mountains that stretch from the Gulf of Liguria to the Black Sea. It lies at an important point near to that at which the chain changes direction from east to north-east. It thus happens that the road which follows the eastern border of the Alps from the innermost angle of the Adriatic Sea continues, beyond the Danube, through the Carpathian foreland of Moravia towards the north-east, and finds its easiest way out, into the northern lowland, through the Moravian gap. This north-eastern road crosses the south-eastward course of the Danube in the basin of Vienna. The communication between the Adriatic and the Baltic by way of the ancient amber road across the great chain of mountains can hardly be of more recent origin than Massalia and Olbia, the Greek trading places which reached out from the two ends of the mountains into the interior of the continent. The history of the basin of Vienna, however, only begins with the establishment of the Roman camp at Carnuntum, which was a main bulwark of the Danube frontier near the exit of the river from the basin of Vienna. It was the central point of the defences from which the Romans kept watch upon the native roads through the valleys of the March and the Waag. The flanks were protected by Brigetio (not far from Komorn) on the east, and by Vindobona on the west. Vienna assumed a very different importance in the Middle Ages, when the Germans pushed their boundaries forward into this neighbourhood against the Hungarian mounted tribes. Vienna was the foremost well-secured outpost against them, protected in the rear and on either side by the mountains and the river, here close together, and requiring to be defended only on the south front, along the river Wien.

Mediæval Vienna, the capital of the "Ostmark" (eastern march), was thus — like ancient Vindobona — primarily a border town. Only when it ceased to be this did it attain to a higher importance. It next became the capital of the Alpine possessions of the Habsburgs. As the tail of a peacock slowly unfolds into a full circle, so these possessions, enlarged by wise domestic policy, grew round Vienna. Six natural districts may be mentioned which have Vienna for their centre:—The Alps, rich in wood, iron, and salt; the country of the upper

Danube, the home of colonists who were continually adding strength to the Austrian forces by whom the east was being settled and cultivated; Bohemia, blessed with silver, coal, and an industrially skilled population ; Moravia, fertile in itself, and valuable, moreover, because it gives access to the northern lowland and Galicia; Upper Hungary, storehouse of precious metals and copper; the Hungarian Plain, an immeasurably rich country of luxuriant meadows and wide pastures, engirt by vineyard slopes. Thus Vienna occupies a position singularly adapted to bring wealth and prosperity to the capital so happily placed as a centre of exchange.

One thing only diminishes the advantages of this situation, the differences of the peoples by whom the countries around Vienna are inhabited. The more sharply marked these racial divergences become, the more certainly will the fortunes of Vienna again undergo vicissitudes that will recall the former, not wholly obliterated condition as a border town. The period of the Turkish wars, indeed, when Vienna once again occupied the position of a door shutting off the western countries from the barbarians, is long gone by. Hungary, which was then a prey to Asiatic conquerors, has become a highly civilised country, but it has also become an independent country with a centre of its own, whose importance diminishes that of Vienna. Moreover, Vienna lies near to the border of the western half of the empire, and even within this, Sclavonic races are striving for greater independence, and are resisting the attraction of the capital.

In her struggle against these centrifugal tendencies, Vienna may safely put her trust in those advantages of situation which have hitherto kept her growing and progressing. With the increased facilities of communication, Vienna has come to the front as a centre of continental traffic. The point at which the lines from Moscow to Marseilles, and from London to Constantinople cross, must remain a focus of European life.

Instead of the mediæval belt of walls, the old kernel of the city is now encircled by the Ringstrasse with its fringe of palaces. Far-reaching suburbs lie beyond it in every direction. Greater Vienna, a metropolis of one and a half million of inhabitants, has overstepped the outer ring of the old communal octroi-line; and the spread of the town on the other side of the arms of the Danube Canal—which are defended from floods—being restricted by the liability of inundation from the river, the outskirts have pushed their way up the hillsides between the vineyards, and, stretching out into the southern plain, have absorbed a number of villages that at one time were separate. This circle of suburbs is animated by industries that touch almost every branch of manufacture, work up raw materials from every part of the empire, and create, not only all the necessaries of life, but also those many accessory adornments, requiring invention, taste, and fancy, which are so dear to the spoilt children of civilisation. Nor is this all; the noblest intellectual life—art and science—finds a home in Vienna, the light from which streams out not only upon the peoples of the great empire, but far over its borders.

Note on Authorities.—While Switzerland still awaits a description worthy of its admirable cartography, the Alpine lands of Austria have been adequately portrayed in five volumes of the work projected by the Crown Prince Rudolf.

The geographical position of Vienna has been described by J. G. Kohl, A. Penck (*Schriften des Vereins zur Verbreitung naturw. Kentnisse*, xxxv. 1895), and Gulliver (*Journal of School Geography*, iv. 1900).

CHAPTER XIII

THE SUDETIC AND CARPATHIAN COUNTRIES OF AUSTRIA

THE SUDETIC COUNTRIES OF AUSTRIA.

WHILE the Alpine territory contained within the Austrian empire occupies with its impressive and beautiful scenery an extensive stretch of country (44,752 square miles), the territory belonging to the Sudetes is less by one-third (30,604 square miles), but contains a population almost one-third larger (9,400,000). The population is, therefore, almost twice as dense, and economic life, in the three basins whose waters may be seen from the Schneeberg near Glatz running towards three different seas, is more richly developed and not so much concentrated to a single focus.

Hardly any other country in the interior of our continent has so clear and self-centred an individuality as Bohemia. Even its old chronicler, Cosmas, points out that no stream flows within it which does not rise within its borders. Other countries, especially Transylvania and Switzerland, might say the same; but Bohemia, instead of letting its rivers run away, as these countries do, in all directions, emits the abundant waters that come down from its wide framework of mountains through one single opening. This fact, and the radial convergence of the watercourses towards the middle of the country, tend to give it an unusual inner solidity and unity, preventing a divergence of economic interests. Aristotle declares *autarchy*, the capacity of providing for itself, to be the necessary condition of political independence; and Bohemia fulfils this condition in quite a unique degree. Except salt, which it lacks, its rocks provide it with every mineral product; while the plants of the earth ascend in a long series from the vineyards of Melnik to the high mountain pastures of the Riesen Gebirge, which rise above the line of the woods, and are only besprinkled with isolated patches of dark dwarf pines.

In the matter of natural qualities of soil, four main divisions of Bohemia may be distinguished. The south Bohemian group of old crystalline rocks falls gradually from the wooded heights of the encircling mountains to an undulating highland mainly given to agriculture. The towns are here sparse and also small, with the exception of Budweis, which has sprung up in the valley of the Moldau at the intersection of the roads from Linz and Vienna, and is a busy trading place. The north-east of the country, as far as the fertile valley of the Elbe, is occupied by the foreland of the Sudetic mountains, and covered for the most part by broken slabs of freestone. The valleys are here the seat of an active textile trade, which is served, not only by water-power, but also by the coal of a bed that extends from Silesia. The glass trade, too, flourishes, especially at the southern foot of the Iser Gebirge and of the mountains of Lusatia. In a valley of their northern slope lies Bohemia's largest German manufacturing town, Reichenberg. The north-west of the country, thanks to the depression of the Biela and Eger valleys, at the foot of the Erz Gebirge, possesses not only some of the warmest and most fruitful tracts of land, but also those great beds of lignite which have given rise both to a mining activity that threatens the hot springs of Teplitz and to large industrial undertakings.

The western part of Central Bohemia, headed by Pilsen, unites a variety of mineral resources, silver ores, iron, coal measures. This wealth has helped to infuse new life into the old capital of the country and to transform the quiet and venerable royal city of Prague into a great modern manufacturing town.

The central position of Prague, where six highways meet, offers many advantages. Lying but ten miles above the emergence of the Moldau from the narrow valley of the old schistose rock into the basin of the Melnik, Prague is low enough to be one of the warmest and most agreeable spots in the country, and to be surrounded by vineyards lying at the feet of the proud hills which were crowned in the Middle Ages by bold castles, and later on by palaces, churches, and monasteries. A striking contrast to the picturesque aspect of historic Prague is afforded by the extensive suburbs, busy with manufacture and modern commerce. Only one-sixth of the inhabitants are of German nationality. Fifty years ago, Prague was reckoned as a German town.

Brünn, the capital of Moravia, is German still: the heart of an area of German speech marking the outpost of the wide stream of German immigration from Lower Austria into that western part of the March basin which is drained by the Thaya. Brünn has grown up at the foot of the steep Spielberg upon a peninsula between two confluent rivers, at the point where the roads from Bohemia and the county of Glatz, which have previously joined, come out into the fertile lowland of Western Moravia. The central position, between the Carpathians and the Bohemian-Moravian mountains, between the Danube and the Sudetes, only received its full value when the modern system of railways came into action. It will, however, never be able to surmount the defect of lying aside from the natural main artery of Moravian traffic, the line of depression between the Bohemian group and the Carpathians. Oddly enough, the other considerable towns of Moravia also lie far to the west of this line. This is the case not only with Iglau, but also with Olmütz, the bishopric of Moravia, and principal town in the upper valley of the March, which was a fortress at one time overlooking the passes of the eastern Sudetic Mountains. Near the northern railway which runs from Vienna along the March and across the sill of the Moravian gap into the upper district of the Oder, the population has of late years increased and pressed into the coalfields of Moravian Ostrau, beyond the watershed, and about the forges of Witkowitz

The part of Moravia in the neighbourhood of Oderberg touches the boundary of the empire, and divides fragments of Silesia which it still retains—the Sudetic duchies of Jägerndorf and Troppau, and the Carpathian duchy of Teschen. The two former, lying aside from the main roads and from the sources of power afforded by fossil fuels, have to depend for their modest prosperity upon the diligence of their inhabitants—exercised principally in the linen trade, but Teschen lies at the end of the Jablunka Pass, which is the great passage-way from Hungary into Germany, and the tributary which Teschen sends to the Oder meets that river in a valuable part of the Upper Silesian coalfield. Those parts of Austrian Silesia, therefore, which are in the neighbourhood of Oderberg are alive with pits and forges. The same is the case in the north-west of Galicia.

THE CARPATHIAN COUNTRIES (GALICIA AND THE BUKOWINA).

The north-western environs of the great outer Carpathian curve, those belonging to the Oder and the March, are so closely related to the Sudetic Mountains, and the south-eastern parts, between the Danube and the Pruth, so intimately connected with the countries of the Black Sea, that only the central portion of this circle of country, the upper basins, that is to say, of the Vistula and Dniester, can be considered as thoroughly dominated by the Carpathians. The importance of mountains as a basis from which states develop is displayed by the history of these parts. The kingdom of Poland, which grew up in the flat country without natural boundaries, eventually planted its foot firmly upon the curve of the Carpathians. Then, and not till then, it gained strength enough gradually to extend its arms to the two seas that are fed by Carpathian rivers. As long as the power of Poland continued to flourish, Cracow was its capital. Even at the present day the tombs of celebrated kings impart a historic interest to the cathedral on the hill of its citadel. As Vienna stands at the south-western outlet of the valley passage by which the Carpathians are divided from the secondary chains of Central Europe, so Cracow faces the north-eastern outlet. This line of valley, along which John Sobieski advanced to the relief of Vienna in 1683, was the main link by which the Polish kingdom in the western part of the east European plain was connected with the Danube and the Mediterranean Sea, with the seats of German Empire and Papal supremacy, German civilisation and Italian art and learning. This great main road was intersected at Cracow by that between Southern Russia and Northern Germany. The town had also easy access, by way of the Carpathian passes, to the valleys of the Waag and the Hernad, while on the north the form of the watershed allowed a busy road to pass along it, cutting off the bend of the Vistula, to Thorn and Danzig, which were formerly the terminal points of the Vistula navigation, whose beginning was at Cracow. The navigation of the river has now dwindled, and carries down in considerable quantities only Silesian coal and Carpathian wood, but it formerly assisted largely in the conveyance of agricultural products and of salt from Wielicska, the traffic in which caused Cracow to be an active centre of trade long before German immigration made it the seat of manufacturing industries. Below Cracow, the Vistula becomes the boundary of Russia,—a fact which hinders its development as a practicable waterway. At the sandy northern point of the country the north-eastward course of the river meets that of the San, which runs north-westward. There is an important cross of ways at the fortress of Przemysl.

In East Galicia the capital is not upon the principal river. The meandering Dniester and its tributaries cut deep into the Podolian plain and intersect the surface of the country in a manner very unfavourable to traffic. When tablelands are cut into deep furrows by rivers, the roads are forced back to the neighbourhood of the watersheds. The old trading road between Cracow and Kiev follows this rule all the more closely because the desolate expanses of wood and marsh on the upper reaches of the Bug forbid it to stray towards the north. At the very watershed between this river and the Dniester, has arisen Lemberg (Lwow), the capital of Galicia, which occupies a sheltered hollow among fertile hills of "loess." The situation has no positive natural advantages. A possibility was offered, however, of drawing together at this point the ramifications of the traffic from Kiev, Odessa, and Galatz, and so making Lemberg the focus of the commercial activities directed into Galicia by places nearer the border of the empire, such as Brody, Tarnopol, and Czernowitz. The direct line of communication with Hungary across the Carpathians also served to bring the richest salt and petroleum deposits of East Galicia—those in the neighbourhood of Kalusz and Drohobycz—into connection with its trade centre. These nineteenth-century commercial conditions were the causes which first brought out the full value of the central situation of the capital, and they have contributed at least as much as the centralisation of legal procedure and the culmination, in three archbishops, of the hierarchies of three different creeds, to give Lemberg a place above that of the once celebrated Cracow.

While Lemberg, in the open foreland, spreads out a network of communications, many smaller Galician towns lie on the border of the mountains at the mouths of the largest valleys. This line of towns, running inside the belt of the great rivers, continues into the Bukovina. Czernowitz, on the Pruth, also belongs to it.

Although three different elements, Poles, Ruthenians, and Roumanians, have successively helped to form the national stock of their peoples, yet Galicia and the Bukowina can be considered as one in the matter of civilisation and social life. The average density of population (eight millions in 34,340 square miles) is not small, when we remember that, in spite of the terrible destruction of forests in Galicia, 28 per cent. of the area is covered by woods, and that agriculture forms more decidedly the basis of economic existence than in any other part of the empire, Dalmatia alone excepted. Eighty-four per cent. of the wage-earners depend upon the land

and various processes of raw production; only 6 per cent. have turned away to manufacture, and scarcely 5 per cent. to commerce. In agriculture a great gulf divides the large landed proprietors from the very small farmers; division of property, carried to an extreme, has reduced the majority of the people to a state of helpless exploitation at the hands of money-lenders. Some of the larger landlords, too, whose property is not always managed in the steadiest way, are falling into the same condition. Manufacture is undeveloped; it consists merely in the collection of the natural products of the earth, and their imperfect working. The instruction of the people is far lower than in the Alpine and Sudetic provinces of the empire.

Note on Authorities.—Bohemia, Moravia, Silesia, Galicia, and the Bukovina, fill five books of *Oestereich-Ungarn in Wort und Bild.*

The development of Prague was considered by F. G. Kohl in 1873, in his *Die Geographische Lage der Hauptstädte Europas*, a work which also deals with Vienna, Trieste, Buda-Pest, Berlin, and Frankfort, delicately weighing the influence upon progress exerted by natural situation, and relation to near and distant surroundings.

CHAPTER XIV

HUNGARY

ALTHOUGH the Carpathians are nearly related to the Alps in formation, and their heights can bear comparison with at least the outer chains of those mountains, yet they do not exercise anything like the same power of attraction over the mountain lovers of highly civilised Western and Central Europe. The High Tatra alone is filled, in the height of summer, by a stream of tourists, who—as in the Alps—bring wealth, refinement, and a higher standard of life into poor valleys, and turn the beauty of nature into a direct addition to the economic assets of the country. In all other parts of the Carpathians this is only the case to a far less degree. Even the medicinal springs, which are at least as various and as effectual as those in the Alpine districts, only succeed in a few cases—such as Trencsin-Teplitz and Pistyan, in the charming valley of the Waag, and Hercules' Bath on the Czerna—in attracting a concourse of visitors at all equal to that of the celebrated Alpine baths. These frequented spots are sparsely scattered, and do not alter the fact that the greater part of the Carpathians is quiet and very little visited by strangers. Many tracts are among the least inhabited in all Europe. This is particularly true of the mountain country at the sources of the Theiss and the Pruth, and of the vast wooded mountains on the eastern and southern borders of Transylvania. It was only where beds of ore invited that a mining population early pushed its way into the woods and mountains. The widely extending district in which the Gran rises has been full ever since the thirteenth century of German colonists, who carried away quantities of precious metal from the lodes in the trachite mountains of Kremnitz and Schemnitz, and from this point a whole belt of mediæval mining settlements stretches eastward as far as Göllnitz and Schmöllnitz, in the Hernad district. All have passed the zenith of their fame, and with the decline in the mining of precious metals, the German nationality, at one time dominant, has declined too. In Transylvania gold held out longer on the south-eastern side of the mountains forming its western border, between the Marosh, the Aranyosh (golden river), and the source of the White Körösh. In these same districts are found the largest deposits of ironstone in Hungary.

Owing to ore and salt mining, a number of little centres of civilisation have thus arisen among the Hungarian mountains, but large towns have no more been formed here, than they have by agriculture in the valleys. The most considerable spots in the mountain districts are where traffic meets: such is Kaschau in Upper Hungary; and such in Transylvania are the Saxon towns of Kronstadt (Brasso) and Hermannstadt (Nagy-Seben), and Klausenburg (Koloshvar) which the Magyars chose as the foothold of their nationality—all of them occupy principal openings into the country.

Within the ring of wooded mountains lie the vast interior plains of Hungary, which are the seat of many-sided and successful agriculture and cattle-farming. Often ravaged and in great part laid waste in the wild old days, these are now occupied by a population thicker than that of the mountains, but there is still abundant space to allow of a progressive increase. The circles of Hungary proper exclusive of the Croatian-Sclavonic kingdom, a territory of 109,000 square miles with 16,721,000 inhabitants, may thus be divided into two groups of equal area, one including the tracts of country on the periphery of the Carpathian curve, and the other the central and generally flat kernel of the country. We find 127 persons to the square mile in the first group and 177 in the second.

The great plain of the Alföld has been settled in a most peculiar manner. There are long stretches with no villages at all, and by far the greatest part of the inhabitants dwell together in towns and large hamlets, with ten, twenty, or thirty thousand inhabitants, which cover enough space for a town of five or six times their population. Their very broad, straight, unpaved streets—a sea of mud in wet weather and a wilderness of irregularities, baked hard as stones, in dry—cut one another at right angles. The square spaces between them are covered, not with houses of urban appearance, but with countrified farms, shut off by solid wooden fences enclosing not only the low dwelling-houses, but also farm buildings, stables, barns, gardens, and a considerable quantity of uncultivated land. This character of a steppe-village on a gigantic scale, built and drawn together only for the sake of defence against hordes of mounted robbers, belongs to the whole of the town, except the centre, where a few modern showy buildings and some rows of better houses surround the market-place (*piacz*), and occupy a handful of streets, in which paving and lighting make some approach to the standard of European civilisation. Many of these townships have very extensive town lands.

Of highroads, in the western European sense, there are none, only the enormously wide uncared-for paths of the steppe, amply sufficient for the light Hungarian vehicles, run between the towns. Latterly, however, many railways have been constructed across the plains, and are joining the towns to the capital of the country. A more independent centre of the Theiss district may be found in Seged, which has been rebuilt since the catastrophe of 1879. The increase in population and improvement in cultivation along the railways are gradually lifting these towns in the midst of the plains to a higher level than most of those which stand at the mouths of important valleys in the mountain framework:—Temeshvar, Arad, Grosswardein (Nagy Varad), and Miskolcz.

The abode of Attila and the Avar rulers might fitly lie in the plain of the Theiss, but when Hungary had become one with western civilisation, it could only establish its capital among the remnants of older civilisation on the Danube. The most considerable towns of ancient Pannonia have come to life again, in little altered positions, as the modern towns of the Danube. The entry of the Danube into the country was guarded in antiquity by Carnuntum, and in the Middle Ages by Pressburg, which grew up on the east side of the narrows and on the north side of the river, at the entrance to the Waag valley, and was intended as a border fortress against the German Empire. Pressburg owed its prosperity to German civilisation, and is still dominated by it. Its value as a crossing-place of the Danube is increased by the great islands which begin in the river just below. Not until the river has collected the additional waters of three tributaries into a single channel again do we come to another crossing-place at Komorn, a town and fortress opposite to the site of the ancient military town of Brigetio. In the narrows, where the river breaks across the mountains that divide the two plains, lies Gran (Estergom), which was the oldest abode of the Arpads, and the seat of the archbishopric, but also, for the space of 157 years, the outermost bastion of Turkish power when at its height. The ruins of the castle of Vishegrad, in the gorge of the Danube, are remains of a royal residence, and show how clearly was understood the importance for rule of the whole of this connection between the two Hungarian plains. During three centuries, indeed, the advantages of a more southerly opening through the Hungarian secondary chain, on the shortest way from Pressburg and Raab, into the middle of the lower plain, were allowed to preponderate. There stood Stuhlweissenburg (Sekesh Feyervar), the place of coronation, the residence and burial-place of many kings.

But historical experience has assigned superior importance to a middle gate between these two, once used by the Roman road which reached the bank of the Danube at Aquincum. Directly south of the ruins of this ancient town the dolomite heights of the secondary chain come close to the river and their rocks, now crowned by the royal castle, and the town of Ofen (Buda) command a splendid view over the powerful stream and, beyond it, over the immensity of Pest.

The crossing-place of the Danube at the hot springs of Ofen was of immeasurable value in the old times of ferry transit, for ferries avoid long river islands as much as bridge-builders seek them. To this point came, not only a road from Vienna which, at Komorn, took in the traffic of the Waag valley and of Moravia, but also the line of traffic from Fiume, Agram, and Stuhlweissenburg, which ran by the edge of the Bakonyan Forest. If we look, however, at a ground plan of the roads from Pest, we see far more rays on the left bank, where unfolds a veritable fan of trading-roads. The radii diverge, at nature's bidding, to Silesia, Galicia, the Bukovina, Transylvania, Roumania, and Servia. Their direction is always fixed by some distant river or mountain pass, and the wide open field around Pest gives them free play as the face of a clock gives it to the hands.

Budapest lies close to the southern border of the mountain country, whence it receives wood and ore, and to the rocky heights of Ofen, which are favourable to the vine, and which provide good building stone and good wine-cellars. Before it lies a prospect of immeasurable plains, the produce of whose rich cultivation and whose cattle and horses are brought hither to market.

The blossoming of Budapest into one of the finest modern cities of Europe is a work only of the last few decades. In 1869 the population was but 270,000, now it is 713,000. Ever since Hungary acquired a more independent position under the constitution of the Habsburg Empire, its predominant nation has been striving to realise a national unity, to which the developments of history have by no means led up. The turning of Budapest into a Magyar town was the first step towards this aim. Every effort is now made to centralise the country; even the modern developments of travel have been pressed into the service of this endeavour. The lines of railway which meet in the capital have made it the seat of a great milling industry, of spirit distilleries, of cattle fattening, and of trade in pigs; while, in another branch, the manufacture of machinery for all the needs of agricultural life is concentrated here. The leather trade, ship-building, and ship-fitting also flourish. But the attraction of this commercial focus, extending even beyond the borders of Hungary, is not felt only by the wares of commerce. The various nationalities are being brought more and more completely under the influence of this Magyar centre. The desire of Hungarian statesmen—a desire which recalls a saying of Alexander—is to mix all the peoples of their country into a loving cup, whose main flavour should be Magyar; and nothing has been of more substantial assistance to them than the zone-tariff, established in 1889, which makes access to the capital astoundingly cheap to the dwellers in the remotest parts of the kingdom. Thus Budapest is, in a truer sense than any other town of Central Europe, the heart whose beat regulates the circulating blood of a strong national life.

Budapest is the first in the series of double towns which border the lower half of the Danube, and are in themselves eloquent witnesses to its greatness. Only one more of these pairs of towns belongs to Hungary—Neusatz and Peterwardein (Ujvidek, Petervarad), which are situated at the last Danube bridge in the country, the often disputed passage which leads to the mouth of the Save, with its pair of towns, Semlin and Belgrade. This is the main road into the interior of the Balkan peninsula. The river traffic passing beneath this bridge is enabled to make its way against the stream for the service of the coalfields at Fünfkirchen (Pecs), the most important town of the country on the west of the Danube (Dunantul). The southern frontier of this district, the river Drave, cuts off the kingdom of Croatia and Sclavonia, 16,420 square miles, with 2,397,000 inhabitants, from Hungary proper.

Of this land only the eastern wing, the district lying between the rivers Drave and Save, falls within the Carpathian framework; the western part is purely Karst country. The territory lying between the two great Alpine rivers, that emerging in parallel lines from the mountains, not only raise the volume of the Danube, but force it to take their own course, is a territory rich in wood and in arable land, the population and productiveness of which may still be considerably increased. Not only the mountain parts, but also considerable tracts of the plain are covered by green forests, the oaks and beeches furnishing food to swine. Traffic in part follows the rivers downwards, and in part passes, by means of the railways, into the valleys of the Alps and to the Adriatic Sea. Both objectives are better served by Agram (Zagrab), the capital and centre of the South Sclavonian intellectual life of the kingdom, than they were by the ancient Siscia (now Sissek), which was situated at the junction of the Save and the Kulpa.

Note on Authorities.—In addition to the seven volumes of the work *Oestereich-Ungarn in Wort und Bild*, devoted to the countries appertaining to the crown of Stephen, and the economic writings of A. von Matlekovitz, I have been allowed, in writing this section, to make use of an unpublished work, *Die Magyaren und ihr Land*, by my friend, Heinrich Winkler, who is certainly the best authority in Germany in regard to the language and civilisation of that race.

CHAPTER XV

THE ILLYRIAN AND BALKAN COUNTRIES

Karst Countries and the Adriatic.

THE south-west of Croatia, notwithstanding its immediate neighbourhood to the sea, is so cut off from the world, so thinly peopled (scarcely 100 to the square mile), so rich in forests (44 per cent. of the area) and in neglected pasture-land (24 per cent.), that this district is economically one of the least developed of the whole continent. Traffic is driven back from the coast by the heavy gales of the Bora. Only one gateway for the outlet of Hungarian commerce to the sea, and this due not so much to nature as to the energy of modern engineering, lies open in the port and district of Fiume, which was cut away from the kingdom of Croatia in 1868, and joined as an exclave to Hungary. This harbour can only properly be considered in connection with the whole series of Adriatic ports, and the Croatian Karst country is but a member of that zone of naturally related countries which extends from the Triglav and the Isonzo as far as Montenegro. No other Karst country except that of Carniola is equal in the extent of its forests to that of Croatia. Istria and Dalmatia are much poorer in timber. Arable and meadow-land greatly diminish in Istria and Dalmatia (to 11 and 7 per cent. in the former and 11 and 0.8 per cent. in the latter); the vine, on the other hand, is more plentiful in these countries (9.5 and 6.3 per cent.) and in the neighbourhood of the town of Trieste (13 per cent.), where its relative extent and economic value become greater than in any other parts of the Empire. The vine is the source of livelihood to the peasant of the coasts, as the breeding of the lesser domestic animals is to the dweller in the rough mountains.

The most richly cultivated land in the whole Adriatic portion of the empire is to be found in the carefully tended plain of Goritz, which has quite the character of Italian farming, though in the actual town which spreads round the mountain and castle, the Sclavonian element is increasing. Goritz, nestling in the warmest nook of the plain of the Isonzo, and sheltered by the mountains from rough winds, so that its climate makes it a winter health resort, takes its share in the heritage of ancient Aquileia. The commercial importance of this town was transferred in the Middle Ages to Venice ; but, in modern times, the activity of communication with the interior has brought not only the trade of Aquileia, but a good deal of the international trade of Venice also, back to the inner angle of the Adriatic and into the harbour of Trieste.

Charles the Sixth, who in the course of his strife for the Spanish throne had come to perceive how much the value of countries depended on the sea, was the first to claim for Austria a free share in maritime trade ; and the importance of Trieste commenced when, in 1719, he declared it to be a free port. The place had not been favoured by nature. At the foot of the steep mountains lay but a narrow strip of coast, now swept by the powerful downward rushes of the Bora, now attacked by the waves which strong and persistent winds drove up from the south-west. There was no natural harbour. Everything had to be done artificially, nor could the completest possible works alter the fact that when the Bora blows violently, the harbour is inaccessible even for strong steamers. Nevertheless, Trieste is a good example of what an enlightened Government may do by persistently working towards a definite end. The enterprise of the Austrian Lloyd Company, started in 1836 by Government capital and subsidised ever since, secures to this port a considerable share in the trade of the eastern Mediterranean, and extends its commercial activities to Brazil on the one hand, and—since the completion of the Suez Canal—to India, China, and Japan on the other. It has still no other feeder than the Southern Railway from Vienna and still lacks direct communication with South Germany. Growing attention is given to industrial pursuits, the raw materials being imported from a distance and assiduously worked up.

In spite of the indefatigable solicitude with which the Austrian Government watches over its port, created by so many sacrifices, Fiume begins to compete with it successfully. This town also was declared a free port by Charles the Sixth in 1725, and in 1776 was assigned to Hungary by Maria Theresa. It was not, however, until that country had attained an independent development that Fiume began to grow into an important place. The harbour works, upon which seventeen millions of florins were expended between the years 1872 and 1892, completely altered the appearance of the shore. Large warehouses with an elevator keep the grain in readiness for exportation, and in almost every department of seafaring, commercial, or industrial activity, Hungary has established in Fiume undertakings that compete with those of Trieste. The shipping, however, is organised with special reference to the west. The population is predominantly Croatian and Italian. The place is in course of rapid growth, and is extending the circle of its inland influence not only into the cornfields of Hungary and the forests of Croatia, but also into Bosnia. This development, too, of Fiume is a triumph of modern industry. Nature did not favour the approaches. The waters of the Quarnero are stormy and inhospitable.

While the busy trading ports of the Adriatic lie on the inmost shore of northerly gulfs, the peninsula projecting between them is the site of the empire's naval port—Pola. Rome had a naval station here ; Napoleon recognised the value of this fine natural harbour ; and now Austria is once more making use of it. Room is found alongside of the navy for the modest trade of Istria ; but Istria and the shores of the Gulfs of Trieste and Fiume, could not alone furnish strength enough for the protection of Austria-Hungary's maritime trade. The weather-hardened peoples of the Dalmatian coast whence old Rome took the crews of her Adriatic fleet, now prevail in the marine of Austria.

The sardine and tunny fisheries of Dalmatia, and the preserving processes arising out of them are progressing and increasing. Some three-fifths of the total maritime activity of the empire belongs to Dalmatia. A considerable trade is divided among its numerous bays. Where the land at the foot of the Velebit Mountains and the Dinaric Alps widens into greater breadth, between the two groups of islands into which it breaks up on the north and south, lie the three principal trading towns, Zara, Sebenico, and Spalato. The first commercial position belongs, not to Zara, whose site, projecting to the north, pointed it out to all the rulers who came from the north, Venetians, Hungarians, and now Austrians, as the seat of the provincial government, but to Spalato, the successor of the ancient Salona. New streets and squares are adding themselves to the original centre so strangely built into the palace of Diocletian, and are encircling the safe bay. An important future may yet await the town if it can succeed in making the bay of Salona, whence the old Roman roads diverged into the interior of the country, the terminus of a railway into Bosnia. The much-desired opening up of the hinterland is likely to touch Ragusa sooner, but there is no danger that the old historic town itself, which preserved its independence up to the times of Napoleon, will have the charm of its quiet walls, its little harbour, and brightly coloured landscape disturbed by the smoke and noise of modern traffic. The scene occupied by this will almost certainly be the Bay of Gravosa, which, divided from Ragusa by a hilly barrier, forms one of the finest natural harbours of these coasts.

The southern part of Dalmatia is a narrow strip of coast at the foot of the Montenegrin Mountains. Cattaro, Austria's strongly fortified naval station, is still the most important opening for communication between the Montenegrins and the outer world, and naturally the object of their keenest desire. The wish to keep Montenegro from the sea, which expresses itself in the Austrian fortifications that press close upon the frontier, has led the Austrians to take possession of Spizza. From this point they mount guard over the Bay of Antivari, which port, however, and the more southern Dulcigno give the Montenegrins but a far-off access to the sea, only to be reached across a high barrier of mountains. The value of this short seaboard, of some twenty-five miles, is further diminished by Austria's exercise of police rights in matters of navigation and sanitation, and by the prohibition to keep war-ships. Thus Montenegro, in spite of the extension of its territory, is more closely hemmed in by having Austria for a strong neighbour on its entirely arbitrary western frontier than it used to be under the elastic and variable pressure upon its enclosure by Turkey. Nor is the share of Montenegro in the Lake of Scutari and the mouths of the Boyana allowed free play, on account of the intractable animosity of their Albanian neighbours. Only the future can show whether the little state will be able really to use its new hard-won possessions in the fruitful lowland and along the coast in such a manner as to increase its own prosperity.

At the present time the countries of the Adriatic, even if we exclude the large town of Trieste, show a rapidly descending scale of population and social importance as we advance to the south-east. Herzegovina stands in the same low rank with Montenegro, which it resembles in natural character, and in the descent and disposition of its inhabitants. Owing to their common political fate it is always spoken of in the same breath with Bosnia, but has no likeness to the Bosnian wooded mountains and green valleys, being a poor, and in many parts an unwatered, Karst country. Wherever a watercourse meets the dazzled eye there is an oasis, which ceases where the water disappears. Busy life is only found at Mostar, in the basin of the Lower Narenta, fertile, but burning hot in summer.

BOSNIA AND SERVIA.

Bosnia and Servia, sister countries linked together by nature, send their waters north-westward into the common channel that carries the Save and the Danube from Belgrade to the Iron Gate. From the point of view of climate the two countries are practically one. In regard to warmth the rise of the land towards the south outweighs the difference of latitude. Both countries are distinguished by extensive oak forests, which supply excellent food for the swine that play a large part in the life of the people and in the economic activities of the country. Another important product for exportation is common to both countries—the harvest of those great plum orchards amid which the villages lie hidden. No other district in the world seems to be even approximately so favourable to the growth of this fruit. That Bosnia and Servia are peopled by the same Slavonic stock makes an ethnological link, too, between the two countries; but their position in the world and their political destinies have brought about different developments.

The confined character of Bosnia affected its religious development in a most decisive manner. In the twelfth century the sect of Bogumils arose here, whose conception of the world and of religious life, which they represented as a continual conflict between God and the Devil, rested, like that of the Manicheans, upon a supposed duality of supernatural powers ruling the universe. This sect was suppressed in the middle of the fifteenth century, but did not disappear. Repudiated by fellow-Christians, it yielded many renegades to the creed of the invading Mohamedans. Thus Bosnia became the strongest north-western outpost of Islamism.

In the course of its twenty years' rule Austria has done wonders in the way of improving the country, has made roads, built railways, opened up the treasures of the earth, caused the surface to be cultivated, and created promising industries. Tourists in considerable number enliven the country, which has a particular charm, due to the Eastern life, that has in no way disappeared with the awakening of the people to modern activity and remunerative labour. If to the existing radii of communication are added railways to Mitrovitza and Novi Bazar, the basin of Bosnia, already connected with the Narenta Valley and the Adriatic, will be open also to the Gulf of Salonica. The 19,700 square miles of Bosnia and Herzegovina were inhabited in 1895 by 1,568,000 (eighty to the square mile).

The number and density of the population in the occupied territory is thus still below that of the kingdom of Servia (18,860 square miles; 2,384,000 inhabitants). But the progress of the latter country has been very much slower in the last twenty or thirty years. The natives lack neither skill nor diligence in their home industries of wool and carpet weaving, but the mineral wealth of the region is left almost untouched, and modern industrial processes, all the natural essentials of which are at hand in abundance, have only lately begun to develop. Over most of the country agriculture persists in its primitive rough methods. Agricultural exports fall far below those of cattle. The vineyards were formerly considerable, but three-fourths of them have been destroyed by the phylloxera. The exploiting of timber, where seriously begun, has rapidly degenerated into destruction. The road system is but little developed; the difficulty and expense of transport obstructs every branch of production, and diminishes the value to the country even of those great railways which have been forced upon it by foreign enterprise, and in part by international agreements, because its geographical position necessitated its inclusion in the European system of traffic.

Belgrade, in spite of its eventful history, produces the impression of a new town. Not long ago it might have been called a village, though indeed a large one. That countrified character which Belgrade has only lost during the last twenty or thirty years still clings to most of Servia's other towns. The right bank of the Danube, from the junction with the Save to that with the Timok, is Servian. Thus Raduyevats, the lowest Servian town upon the river, was able to have direct communication with the sea even before the regulation of the watercourse at the Iron Gate. Now Belgrade itself can be reached by the vessels of the Lower Danube. Inner Servia could make even fuller use of this waterway if the Morava also were again made navigable, as it was down to the seventeenth century; but this river is closed in many places by mills and fisheries. Beside it runs the railway from Belgrade to Salonica, which leaves Servian soil at Vranya. Among the many towns which it touches is one of great antiquity, occupying an indestructible natural position—Nissa, where the railway to Constantinople and a road into the Timok valley branch off. The northern border, the centre, and the east of the country are thus traversed by important lines of international communication, but the mountain country of the south-west remains untouched by these currents of general life from without. Great duties in the direction of internal social development still lie before the country. Quiet, honest labour would be more advantageous to it than pretentious boasting about future claims, that are in glaring contrast with the weakness of a disorganised budget and unbridled party dissensions.

THE COUNTRIES OF THE LOWER DANUBE AND THE BLACK SEA.—BULGARIA AND ROUMANIA.

Bulgaria is the most recent of European political formations. It gained its footing under very difficult conditions, but by the addition of the Turkish province of East Roumelia, the tributary principality became a state comprising 37,320 square miles and 3,733,000 inhabitants. The division of the territory by the Balkans, which run through the centre, involves no risk to the country's continuity, because the inhabitants are of the same stock. In times of danger it is rather an advantage, as giving an inner line of defence in case of any conceivable attack. The frontier lies most open towards Turkey, to which the waters run down from the wheat-growing plains of East Roumelia. The products of the country do not take quite the same direction, but are chiefly carried by the railway from the interior to the Bay of Burgas, which, however, has no harbour for ships, but only an imperfect roadstead. The favourable climate on the southern slopes of the Balkan allows of the cultivation of rose-gardens among the chestnut groves at its foot, and the perfumery trade of Europe is supplied from them; vineyards follow the foot of the Sredna Gora and the mountains of Rhodope, and in the warm moist hollows around Tartar Bazardjik and Philippopolis there are fields of rice. In addition to the many products of the land, the harvest of which brings down workers every year from the Balkans, East Roumelia had formerly extensive trades which supplied many parts of the Turkish Empire with woollen stuffs and with leather and metal goods. The removal of the Turkish population and the customs frontiers have led to the decay of these old industries. In this respect, too, the country is passing through a difficult period of transition.

The site of the capital of Eastern Roumelia, Philippopolis, in the centre of the plain, was determined by seven rocky syenite hills, washed by the waters of the Maritza, and it has remained, ever since it was founded by the maker of the Macedonian Empire, the principal place in the plain, though its unfavourable situation in regard to the more important mountain passes to the north and south, has always kept it within fixed limits. Sofia, the capital of Bulgaria, stands in a better position in the basin at the source of the Isker, and near the hot springs that rise at the foot of the majestic Vitosha. Although the narrow gorge of the Isker through the Balkans is impassable, this point in ancient Serdica is still not only the mathematical and hydrographic centre of the main peninsula, but also a crossing-place of important lines of communication. This fact made so deep an impression upon Constantine, who knew and appreciated the country round his home at Nissa more exactly than any other ruler of antiquity, that he exclaimed, "Serdica is my Rome," and seriously inclined to make that place the capital of the empire, until weighty reasons led him to decide upon Byzantium. After a long period of neglect, Serdica, which was not called by the name of Sofia (after its cathedral, now destroyed by an earthquake) until the end of the fourteenth century, is reviving again, and when the railway in course of construction from Bucharest to Salonica here crosses that from Belgrade to Constantinople, the Bulgarian capital will recover the importance which it owed of old to its position. In regard to the present boundaries of the country, the position of the capital seems singularly out of the centre. This would no longer be the case if the hopes of the Bulgarians for the future possession of Macedonia were to be fulfilled even in part. Even now, since the inclusion of East Roumelia, the southern slope of the Balkan bears a decidedly larger share of the inhabitants and of the power of Bulgaria than does the northern. Varna, the largest maritime town in Bulgaria, will certainly go to decay unless its insecure roadstead is strengthened by the formation of a harbour. Its naval importance is distinctly less than that of Constanza in the Dobruja, with a mole and harbour. This little seaport, which suffered absolute depopulation even in the wars of the last century, has been gaining in activity and promise since the erection of a solid bridge over the Danube at Czernavoda linked it with the railway system and the capital of Roumania.

The superiority of Roumania to Bulgaria is shown even more plainly than along the sea-coast in its utilisation of the Lower Danube, since the acquisition of the Dobruja. In all the pairs of towns that have grown up at the more important crossing-places of the Danube, the Roumanian place is always more active in commerce than the Bulgarian, even when its population is smaller. For a long time navigation on the Lower Danube was very backward. Now, however, great quantities of grain and other agricultural produce are carried down, as well as wares from the mills and distilleries along the river-banks, part going directly to the Black Sea, but the larger portion to the river-ports of Braila, Galatz, and Sulina, there to be transferred from the river-boats into large sea-going vessels. Of these towns, in which sea-traffic comes far inland, Braila, where the river, after a long separation, gathers the waters into one channel again, above the junction with the Sereth, now succeeds in taking the first place. This rising centre has taken most of the trade of Wallachia from Galatz, which lies, almost entirely surrounded by water, between the mouths of the Pruth and the Sereth, and is more conveniently placed for the Moldau and the Bukovina, which send hither not only their farm produce, but also great quantities of timber from the Carpathian forests. The trade of these two river-towns is carefully fostered by the Roumanian Government. A considerable part of it is in the hands of Greek firms; the Greek merchant service, too, contributes a growing contingent of the vessels which come into the estuary of Sulina, bringing European manufactured articles and coal, and taking away heavy cargoes of the country products. The flag most strongly represented in this port is still the British, although its proportional superiority is being greatly diminished by the efforts of the Danube States to get navigation into their own hands. Hungary has lately taken an important step forward by the establishment of its Levantine merchant service, and Roumania is also successfully developing one.

The river, which favours this entrance of Roumania into the commerce of the world, is also a most valuable source of livelihood to the people of the country. The annual takings of fish in the channels and in the extensive lagoons along the banks of the Danube and the sea-shore are estimated at from 80,000 to 100,000 tons.

In the immediate neighbourhood of the reed-beds of the delta and the network of islands above Braila, lies the driest part of Roumania. The steppes of the Dobruja, and the not much more favoured country on the opposite western bank of the Danube, form in the centre of the two-winged country a territory of more than 10,000 square miles, where—excluding the one town Braila—there are living but 470,000 persons (47 per square mile). This tract of country, a desert subject to alternations of excessive heat in summer and storms in winter, emphasises the division between Moldavia and Wallachia.

It is only since the establishment of Roumania as an independent state that "the Paris of the East"—as the Roumanians rather pretentiously call their capital—has risen to the external brilliancy of a royal residence. Its situation in the hot and dusty plain makes summer hard to endure in it. The court generally retires to Sinaya at the foot of the Bucsecs, in the pleasant coolness of a Carpathian valley, and the Boyars too seek cooler places in the country. A short railway journey takes us from the plain to the encircling hills with their shady groves of plum trees and their vineyards, and beyond these lie the woody mountains, from which it is hoped that the future may obtain more mineral treasures than those found at present: salt and natural oil. The zone of these mineral products passes round the outer border of the mountains, and on into Moldavia. The towns in it are characterised by a strong Jewish admixture. Jassy, the old residence of the Hospodars, which lies in a side-valley of the Pruth basin, is by far the most important of them, and its picturesque position and clear mountain streams give it an advantage over Bucharest. The roads to Odessa and Galatz divide here; but the main line of communication of the Carpathian country follows the Sereth farther to the west until it divides into two parts, running to Bucharest and to Constanza.

The carefully laid out system of communication shows, like every other department of life in Roumania, an earnest effort at advancement. A position of geographical importance, extensive tracts of fertile country, national unity and the energy of the people promise to this state (with its 50,600 square miles and its 59,130,000 inhabitants) a considerable future.

Note on Authorities.—Two volumes of the work begun under the patronage of the Crown Prince Rudolf deal with the Adriatic provinces of Austria, while another is devoted to Bosnia and Herzegovina. This book, admirably written by authors familiar with the Occupied Territories, undoubtedly stands out superior to the mass of literature which has grown up around these newly opened countries.

A description by a single author is expected from Edward Richter.

The best work about the Balkan countries is Constantine Jirecěk's *Das Fürstentum Bulgarien*, 1891. Spiridion Gopčevic's *Serbien und die Serben*, 1888, is not to be compared with it.

The older works of Kanitz are still indispensable.

CHAPTER XVI

SOUTH AND CENTRAL GERMANY

THE most important members of the complex mountains of Central Europe unite in enclosing an expanse whose waters escape in two great rivers at Bingen and at Passau, whence their courses cross rocky barriers the original dangers of which have only been fully overcome by the engineering skill of the nineteenth century. Apart from these two waterways, the mountain framework of South Germany lies open at several large gaps to communication with its neighbours, whose influence has been all the more strongly felt because South Germany, notwithstanding the prevalence of flat formations, does not make a united whole, but is, on the contrary, conspicuously divided. The south, up to the Danube, is filled by the German Alpine foreland, the west by the Upper Rhine valley; between the two prevail the terraces of South Germany with the Neckar and the Main flowing through them; and the three sections, like a piece of a fan whose ribs are represented by the Black Forest and the Rauhe Alb, meet between Schaffhausen and Basle. Neither the distribution of the Germanic races nor the political demarcation coincides with this division of the land. The Alpine foreland was only occupied by the Bavarians up to the Lech; there began the domain of the Alemanni or Swabians, which comprised the Alpine foreland to beyond the Aar, the Upper Rhine valley and the mountains round it northward to the Neckar and including the basin of the Neckar. Finally, the Franks filled the Palatinate, the piece of the Upper Rhine valley lying beyond Swabia, and the whole Main basin. This position of the Franks between the tribes of South and

North Germany might appear originally to offer a promise of uniting and ruling the whole, but, later on, it caused them to have difficulty in maintaining independence even within their own borders. The very districts of Franconia and Swabia, in which Otto von Freising (1150) saw the firmest support of the German Empire, were those most broken up in the Middle Ages by political divisions. Nowhere were separate communities, free towns, castles, and monasteries, walled in and armed against one another, more numerous. These districts, which were the inmost and safest part of the Empire, and which were not driven to hold together by any pressure of great outward danger, carried the feudal system to such an extreme that the territory was broken into little pieces. The western part fell a prey to France; the fragments of the other parts passed through all the stages of humdrum comfort, absurdity, and misery that belong to extremely small states, until the wars that followed the French Revolution swept them together and recast them into a few states of moderate size, which, however, enjoyed no protection on their exposed side, until the conquest of Alsace and Lorraine. The following are the territories at present existing: the kingdoms of Bavaria and Würtemberg, the grand-duchies of Baden and Hesse, and Alsace Lorraine, besides the little principality of Hohenzollern which has been Prussian since 1849. Geographical presentation cannot conveniently follow the political boundaries, but would shut out Bavarian Vogtland and Upper Hesse, and include in place of them the Prussian district at the southern foot of the Taunus from Hanau to the Rheingau, thus giving to South Germany a slightly smaller area (50,800 square miles), and a little more population, 13⅛ millions.

THE ALPINE FORELAND OF GERMANY.

The most genial part of the Alpine Foreland of Germany is the shores of the Lake of Constance, dominated by the glorious Alps, and girdled by vineyards and orchards. The course of history has prevented Constance from gaining all the advantages that naturally belong to its position, and has permitted it to enjoy only a slight superiority over the other towns of the lake. For traffic between Germany and Switzerland, which has to cross the lake, the towns in Würtemberg and Bavaria are more conveniently situated. As we go from them northward into the tableland, woods and heath grow more extensive, and villages—in Bavaria single farmhouses—lie farther apart, with wide pastures and cornfields between. The larger towns are always linked to the deeply cut furrows of the rapid rivers.

Augusta Vindelicorum was the first capital. It collected the traffic of the Roman roads that crossed the Alps between the Splügen and the Brenner, and offered to the traffic of the whole Alpine foreland a central point about equidistant from Geneva and from Vienna. The full Alpine rivers of the Lech and the Wertach, which formed a natural protection by surrounding the site and uniting below it, no doubt fixed the place of the Roman colony; while, in the Middle Ages, they, and the smaller streams running from the well-watered rubble of the Lechfeld, served to support the busy and diligent industries which made Augsburg a wealthy town holding a position of importance in international trade. Situated on nearly the same meridian as Verona and Nuremberg, Augsburg was well fitted to become the agent of trade between Venice and Central Germany. The most direct continuation of the Brenner road had its terminus here, and to the north across the Danube the deep valley of the Ries opened, in which the roads to the Neckar and to the Upper Main divided. It was not until the internal conflicts of Germany after the Reformation that this free town dropped behind as compared with other places carefully fostered by their princes. Augsburg is, indeed, thanks to its abundant water-power, once more a great centre of the textile trades, and, thanks to its situation, once more a great nucleus of traffic; but it is only the third town of Bavaria, and is quite overshadowed by the capital.

Munich is situated upon the field of gravel brought down by the melting water of Alpine glaciers. It was recommended to the Bavarian dukes by its central position between the Lech and the Inn, between the Alps and the Danube. Even before the Thirty Years' War this was considered as one of the most beautiful towns in Germany. But its development into a great city belongs entirely to the nineteenth century. The recasting of the whole system of communication in the railway epoch enabled the Bavarian Government to raise Munich into an important centre of traffic, and especially to fix here the crossing of the highways from Paris to Vienna, and from Berlin to Rome. At the same time, Munich developed its manufactures, and a fresh impulse has been given to this advance by the utilisation of the Isar's water-power. The first place as to quantity of production is occupied by the great breweries. The manufacture of machinery and utilisation of the raw materials—marble and wood—from the mountains have also made great strides. In a town where 1700 artists are at work, manufactures can hardly fail to be touched by some ennobling breath of ideality. Science, too, has been cared for, and the important applied branches of it constantly find themselves faced by difficult technical tasks and by the problems arising out of ever-new methods of employing the forces of nature. Munich has thus become a centre of civilisation of universal importance, and far outstripped the development of the towns on the banks of the Danube.

A little below the mouth of the Iller arose Ulm, the starting-point of navigation, and the place from which the Geislingen path carried the Alpine traffic into the Neckar basin. The now completed wonderful tower of the Gothic cathedral, the highest stone building on the Continent (528 feet high), stands like a proud memorial to the might and pride of the citizens in the old free town, and looks down on the ring of forts which testifies that the importance of this position is by no means entirely a thing of the past.

The northernmost bend of the Danube offered a still happier site. Here as early as the sixth century Ratisbon was the seat of government of the Bavarians.

From this point began the advance of German colonisation towards the east, and hence trade took possession of the Danube. But a river that ran into foreign countries was not in those days a safe roadway for far-reaching enterprises. From the era of the crusades the sphere of influence of the Danube town diminished. The more resolutely it defended its independence as a free city, the more determined became the endeavours of the dukes of Bavaria to find for themselves another centre of power. So successful were they, that long before the last meeting of the German Diet—of which it had become the permanent seat—Ratisbon had fallen far behind Munich. Its reunion with Bavaria came too late to change this state of affairs, though the development of the railway system, and the improved navigability of the Danube, have breathed new life into the town. It is now the capital of the Upper Palatinate.

THE DISTRICTS OF THE NECKAR AND THE MAIN.

The boundary by which the Alpine foreland and the Upper Palatinate, the waters of which likewise drain to the Black Sea, are divided from the right-hand tributaries of the Upper Rhine, consists, not in the sharp line of a watershed, but in a broad sparsely peopled belt of jurassic limestones and ill-watered plateaus, the Swabian portion of which only obtained water enough for the subsistence of the inhabitants by means of irrigation works on a large scale that were carried out in the years between 1876 and 1885. The uninviting character of these tablelands increased the density of population in the villages and little towns on the Neckar. Here subdivision of property and intensity of cultivation are carried to the highest possible pitch. The increase of population—unless it swells the stream of emigration—can only find subsistence by subserving the manifold industrial employments by which the whole country is permeated. These have brought fresh life to many a little old historical town, but have not created any of the large, cheerless, smoky towns that generally rise upon coalfields. An old Roman town once lay in the warm and friendly valley-opening of Cannstadt, which was formerly reckoned as the starting-place of navigation on the Neckar. Now, however, it is but a suburb of the capital of the country, Stuttgart, which lies, with its splendid squares and web of streets pressed in between vineyards, in an enclosed valley to the left, situated amid beautiful and picturesque scenery but off the natural line of traffic. There was nothing in the nature of the locality to favour the growth of a large town. But the very distance and independence of Augsburg, and of Ulm, the natural capital of Swabia, and the lack of any predominant centre of population in the Neckar country, made it easier for the rulers of Würtemberg to raise the place they had chosen. The line from Paris to Vienna has had to leave the Neckar valley and make a long loop in order to touch Stuttgart at all, and modern engineering has made an outlet at the southern end of the valley's *cul-de-sac.* But the main causes of Stuttgart's prosperity are the activity of the Swabian people, concentrated at this point by their rulers, and the skill with which branches of industry that do not depend so very much upon locality have been transferred hither. Stuttgart is one of the leading seats of the book trade of Germany, and of the industries arising out of that trade. The thoroughness and productivity of the people have brought the town successfully through times when, in the eighteenth century, those in power were ill disposed towards it, and when two efforts were made to set aside Stuttgart and to remove the royal residence to Ludwigsburg, a hunting castle in the beech woods of the plateau on the left bank of the Neckar. The town of Stuttgart is now so large and so brilliant, and has become so attractive a place of abode, that any suggestion of the kind is no longer to be apprehended. Among the other towns of the Neckar, all far outstripped by Stuttgart, Heilbronn is the most flourishing; and its trade is assisted by the steam navigation, coming up to this point, and by the easy crossway communications between the Rhine valley and Franconia. Below Heilbronn the Neckar gathers together all the waters of the Swabian basin before entering the gorges of the Odenwald.

Leaving the dense settlements of the Neckar valley, we have to cross the Franconian Height, a sparsely inhabited tableland on the east, chiefly occupied by agriculture, before we come again to a large town. The landscape round Nuremberg is without charm; the sandy plains are covered with Scotch firs, and can only with difficulty be brought under cultivation. To the mediæval traffic, however, the crossing of highways was favourable. In its buildings and art treasures the old town still preserves eloquent memorials of its past history. No melancholy elegies, however, finish this glorious history. Nuremberg's trading inclinations have outlived its independence as a free town; it has grown up into a great modern manufacturing place, though neither a river of any importance nor a bed of fossil fuel was at hand to afford sources of power. In metal-work, in the manufacture of blacklead, glass, and wooden ware, Nuremberg stands at the head of all the towns of South Germany, and electrical works of world-wide reputation have now been established there in addition to the great machine factories. This independent evolution of its own powers has for the second time brought Nuremberg far ahead of the episcopal towns of Franconia; the venerable Bamberg, which lies a little away from the Main, with the hills of its churches and convents adorned by hop-gardens, while their feet are encircled by productive vegetable gardens; and Würzburg, where the bells that tinkle for mass are answered by the gay songs of students inspired by the best wine that grows on the banks of the Main. Bamberg is the most rural of the middle-sized towns of Germany; Würzburg is gradually being drawn into the net of industrial competition. While Bamberg is but one of several spots by which, as well as by other ways more to the east, traffic passes from Franconia to Saxony, Würzburg is the only crossing-place of the Main for communication between Swabia and Thuringia. The navigable value of the Main is diminished by its puzzling windings, and by the small volume of water in summertime. Thus, in spite of all the efforts to strengthen the navigation of the middle Main above the Spessart, it serves for little at Würzburg, except for a considerable flotation of timber.

THE LOWLAND OF THE UPPER RHINE.

Nature has laid no precious treasure in the lap of the mountains that encircle the warm lowland of the Upper Rhine; she has only crowned their heads with forests, the most beautiful of all Germany. Amid these wide hunting-fields arose mediæval monasteries, which became centres of settlements and of gradual clearances in the forest. They drew their subsistence from a laborious and not very profitable cultivation of the ground, and from the forest, the trunks of which were floated down on the swollen tributary streams to the great river. It was the eighteenth century which first gave to the increasing population of the Black Forest those various industries which the nineteenth has brought into a condition of flourishing development. At the northern end, Pforzheim is the centre of a jewellery trade, which is also carried on in neighbouring villages. In the centre of the Black Forest, around Furtwangen, the famous clockmaking industry flourishes. In the highest parts of the mountains, about the Feldberg, many villages are occupied with brushmaking. In the valleys of the Wutach and the Wiese, which open to the south, the textile trade, especially in cotton, has made great way, supported by water power, and encouraged by the example of Northern Switzerland. All these busy places, however, are oases of civilisation in the great still woodland. The fresh air of the forests breathes up to the immediate neighbourhood of the thickly peopled western border of mountains, where vineyards, orchards, and tobacco plantations stand on the loess-covered hills, around rich villages and busy townships animated by trade. This outer belt at the foot of the mountains, marked by density of population and great subdivision of property, is generally succeeded by a damp country, rich in meadow-land, the waters of which mostly run northward, and are apt to be obstructed by accumulations of silt, and so to form swamps, which can only be reclaimed by care and attention. Broad plains of gravel and considerable woods divide these damp hollows —which were formerly erroneously supposed to be traces of an old easterly course of the Rhine—from the strip in which, before its regulation, that river used, like a capricious tyrant, to change its course from one part to another, and threaten destruction to the settlements along its banks. A similar valley formation occurs on the left bank in Upper Alsace, where the Ill runs parallel with the Rhine, and divides the woody country along the main river from the richly cultivated foot of the mountains.

These parallel tracts of country, so essentially different in their nature, have had a decisive influence not only upon the divisions and the fortunes of the rural settlements, but also upon the position of the important towns. The low-lying plain of the Upper Rhine, with the kindly water-power of the river, and with the great roads dividing at its northern and southern ends, offered several admirable sites. The Romans reached the Rhine first by the Burgundian gate, and the first Roman town upon the Rhine, the colony of Raurica, the predecessor of Basle, came into existence in front of that opening. Then, when the whole Rhine became the frontier line of the Empire, the left bank was bordered by the camps of the legions, and by the towns that grew up near to them. The most important of these was Mogontiacum, opposite to the confluence of the Main. The mouth of another Roman way into the upper valley of the Rhine was marked by Argentoratum, on the Ill, the germ of Strassburg. The erection of Roman fortresses along the Rhine gave to the left bank the advantage of a rather greater stability in the sites of its chief towns. All the smaller towns along the western mountain border—and for a long time those on the Ill, too—remained much inferior to the three old foundations, upon the sites of which three great bishoprics grew up in the

Middle Ages. In the seventeenth century the barbarous warfare of Louis XIV. destroyed the towns of the Palatinate on both sides of the river, especially Heidelberg, which had arisen at the point where the Neckar emerges from the mountains, in a situation similar to that of Freiburg in the Breisgau, and of Frankfort-on-the-Main. The caprice of a despot next created the royal residence of Carlsruhe in a barren, sandy woodland. As this town grew up after the days of the Rhenish Confederation, so did Darmstadt, the not much better situated capital of a little state, both developing at the expense of neighbouring towns of greater natural importance. On the whole, the right side of the Upper Valley of the Rhine has shown itself the more progressive in the growth of its towns in the nineteenth century ; the towns of Alsace were actually dwindling as long as they continued to be frontier towns of France, and Strassburg has only begun to flourish once more since the whole extent of the Upper Rhine Valley, filled by the German nation, has again become an integral economic part of the German Empire.

The complexities of town development that arose from the unsteady course of history may best be comprehended if we consider the different sections of the lowland of the Upper Rhine without regard to the political boundaries of the various groups. One of the most suitable situations for a town in all Europe is occupied by Basle. While it was a member of the German Empire, Basle was large and flourishing. Its severance (in 1501) no doubt spared the town many troubles, but also set narrowed limits to its future development. The centre of traffic and intellectual life thus lost has been replaced in that uppermost portion of the Rhine Valley of which the Kaiserstuhl may be considered the boundary, by towns growing up in situations of less natural importance—Mülhausen, on the Ill, and on the Rhine and Rhone Canal, which is the chief seat of the cotton trade in Central Europe; and Freiburg in the Breisgau, a university town standing amid vineyards in a beautiful curve of the surrounding mountains.

The middle part of the Upper Rhenish lowland finds its natural capital in Strassburg. The French, who made every effort to bind Alsace firmly to their own country, made Strassburg the terminus of the two canals which connect the Seine (by way of the Marne) and the Rhone (by way of the Doubs) with the Rhine, but all their endeavours did not succeed in bringing back to Strassburg its old prosperity. The old encircling wall, which sufficed during the whole of the French rule to embrace the territory of the town, has now fallen, and new spacious suburbs have gone beyond it. Far outside the town lies the circle of new forts, commanding also the passage of the Rhine. That river itself, which was so long only a barrier to the economic development of the town, is now once more the medium of its increasing commercial activity. Strassburg is making every effort, by improving the navigable channel, to draw up to itself a greater share in the traffic of the Rhine. A great harbour is being constructed for its reception, and this may perhaps become the point of departure for a new waterway to Basle. Nor does intellectual life fall behind in this general movement of advance. It finds its focus in a university of high repute.

The eastern continuation of the road that here touches the Rhine lies not so much in the valley of the Kinzig—through the picturesque glens of which the Black Forest railway now runs to the Lake of Constance—as northward, where the line from Paris to Vienna passes round the Black Forest, amid the hill country of Pforzheim. It thus touches the capital of Baden, a rank long lost by the famous seat of hot springs which gave its name to the whole country, drawing together the wealthy of the civilised world by a combination of hill scenery and luxurious comfort; a rank lost also by Durlach, which stands at the entrance to the best road into Swabia. In 1715 a Margrave who was angry with the people of Durlach, built himself a new castle in the midst of the fir woods of the Rhenish plain, and desired to make this castle a centre from which the main streets of a new court-town were to start. Such was the beginning of Carlsruhe. The concentration of law courts and government offices, the junction of the railways, and a connection with a new town on the Rhine, Maxau, succeeded in establishing a city here, which obtained importance as a centre of traffic and manufacture. Even now, however, Carlsruhe falls conspicuously behind Strassburg, its counterpart to the west of the Rhine, and even behind another town of its own country.

The bareness of the banks of the Rhine, which bear no town of any size for more than 140 miles below Basle, ends in the Palatinate. The old and venerable free towns of Spires and Worms, whose cathedrals still recall their former glory, have never recovered from the destruction in which the barbarity of the *Roi Soleil* involved them; but between them at the confluence of the Neckar, Mannheim has arisen from its ashes and become the greatest river-port of South Germany. A share in the great concourse of traffic that presses into this basin, laid out and furnished with every appliance of modern engineering, has been secured to the left bank of the river—belonging to Bavaria—by the foundation of Ludwigshafen. From the point of view of economic geography, these two towns form but one great centre of population. It is evident that the terminus of the Rhine's mercantile navigation, which used to be at Mayence, has moved up, with the improvement of the river, to Mannheim. Here are delivered the consignments of grain from over-sea, of American and Russian petroleum, and of coal from the Lower Rhine, required by South Germany; while wood and salt, which are floated down the Neckar, stand at the head of the exports. This powerful commercial position is subject to severe competition, not only from Frankfort and the growing efforts of Strassburg, but also from the endeavours of the Hanse Towns, which are supported by the State railways, to attract to themselves a part of the trade of the Rhine delta. But transit is so rapid and so easy on the fine river that it keeps ahead even of strong competition. Whether it is possible to carry the Rhine trade higher up the stream must still be proved by experience. For the present, the towns at the mouth of the Neckar are in a condition of cheerful advance; and any observer who, amid the busy bustle of trade and manufacture that marks these recent centres, misses the historic charm belonging to the other leading cities of the Rhine, need only follow the Neckar to the opening of the mountains. There, above "old Heidelberg," frown the ivy-wreathed ruins of the castle of the Electors Palatine—a serious and melancholy warning to the German youths who flock hither that when they become men their duty is to preserve the unity of their strengthened fatherland.

Mayence has been deposed, in spite of its extremely promising situation, from the supremacy which it enjoyed for centuries, and has retained only the honour, often dearly bought, of being the protector of Germany's most favoured district. But though Darmstadt, in its character of the capital of a little state, and the seat of its law courts and technical college, is now increasing more quickly in population; and though an artificial concentration of railway traffic and growing industrial activity are driving away the dulness that used to gape at the visitor from the empty streets of this court-town, Mayence will still remain for some years to come the largest town in Hesse, and will continue to be its most important centre of industrial life.

Wiesbaden, standing amid hot springs at the southern foot of the Taunus, and nestling among the green of luxuriant gardens, competes in the antiquity of its fame with Mayence. It is a large and luxurious town, spacious and full of gay villas, the favourite rendezvous of the great and the wealthy from all parts of Europe, the most international spot of hospitable Germany. From it a belt of rich and pleasant country, with vineyards, orchards, pretty villages and towns, runs at the foot of the Taunus as far as Frankfort.

The situation of Frankfort, where in the Middle Ages the Germans from all parts met for the election of their

King, has won new importance long after the days of the Confederation ; indeed, it has only fully developed since a strong Government arose to make full use of its natural advantages. The commercial importance of Frankfort, which is one of the richest towns in Germany, and has an influential stock exchange, is shown in the present day by the new docks, and by the immense railway station, which receives the traffic of eight great lines. Frankfort had, ever since very old times, been one of the most beautiful towns in Germany; and it is now, by the inclusion of great suburbs, also one of the largest. It has become so partly owing to the trading activities of "the Golden International," who is particularly numerous in the native place of the Rothschilds, and partly owing to its considerable industrial population. The latter side of its economic life is served by the towns of Offenbach and Hanau, lying in favoured spots a little higher up the Main, the one being perhaps the first town in Germany for the manufacture of fancy leather goods, and the other noted for its jewellery. Thus all departments of human life, from the most arduous labour to the easiest leisure, find their places in this garden of Germany at the southern foot of the Taunus, and combine to form a delightful picture of peaceful but powerfully protected happiness. Along the short river reaches of the Rhine and Main between Offenbach and Biebrich 550,000 persons are living upon 230 square miles. The impression produced by this highly favoured district is doubly strong, because to the south of the Main it ends suddenly, at the edge of extensive sandy woods of Scotch fir.

The western outlets of the Lowland of the Upper Rhine are by no means more difficult than the passes of the Black Forest. Yet the Vosges and the mountains of the Palatinate always formed a more effective barrier. It is noteworthy that while the German inhabitants of Alsace, the Alemanni, came from the east, Lorraine, on the contrary, was taken possession of by the Franks from the north. They found here so strong a centre of Roman population, that as soon as divisions according to language began to arise, the Romanic tongue had preponderance throughout the greater part of Lorraine. As long ago as the year 1000, Metz stood in a French-speaking territory. Even at that time the frontier line of language ran between the French Nied and the German Nied, and crossed the Moselle half way between Metz and Thionville. The conquest by France in 1552 of the three bishoprics of Metz, Toul, and Verdun, which belonged to the German Empire, brought the frontier of the country into nearer agreement with the division of tongues. It was not until the seventeenth century that France extended its conquests far into German country. Only considerations of the better safeguarding of the western frontier against the French desire for revenge induced the leaders of German policy in 1871 to retain the strong position of Metz, which has now mainly become a German military town amid French-speaking villages.

Economically, four tracts of country are plainly to be distinguished in German Lorraine. (1) The east, up to the valley of the Saar, unites agriculture and various forms of manufacture, in particular a highly developed glass trade; the little industrial towns of the Saar valley enjoy the advantage of fuel near at hand, which is brought up cheaply by water; the coalfields of the Saar extend into Lorraine at Forbach. (2) Between the Saar and the Moselle lies a thinly-peopled plateau, which, however, contains the great salt bed of Chateau Salins. (3) The greater warmth of the Moselle valley fits it for the cultivation of the finer fruits, although the vine does but moderately well; high cultivation of the land is here the foundation of prosperity. (4) The plateau to the west of the Moselle is the iron district of Lorraine, the productiveness of which, under the freer mining law of Germany, has increased tenfold since 1871, and like the neighbouring district of Luxemburg, is taking an increasing part in the manufacture of the ore into cast and rolled iron. In its extensive iron-mining, in the general character of its landscape, its social conditions, and the density of population (217 to the square mile), Luxemburg (a territory of 1000 square miles) most obviously corresponds to German Lorraine.

THE MOUNTAIN AND HILL COUNTRY OF CENTRAL GERMANY, WITH ITS BAYS OF LOWLAND.

The basins of Bohemia and South Germany allow their waters, which run northward, to escape, after having united, by way of the narrow outlet valleys of the Elbe and Rhine. These two are the only rivers which pass through the full breadth of the barrier of the mountains of Central Germany. The unity, however, of this belt of mountains, which runs across Germany from the Meuse to the Vistula, lies not only in the continuity of their elevations, which is broken but twice, but also in certain characteristic features common to the whole zone of uplands. Their height, which, on the whole, increases towards the east, is sufficient, near the ocean on the west, no less than in the interior of the continent on the east, to draw considerable deposits of moisture from the atmosphere, so that the watercourses, which rise amid them, receive considerable, though indeed variable, strength and abundance, and the navigability of the rivers, which they unite to form in the plains, is assured. The mountains are rich in timber and in excellent building stone, which is valued in the diluvial plain that lies in front of the mountains; some parts are rich also in ores, and the northern border in particular often contains great beds of fossilised fuel. To this wealth of the mountains acceded the fertility of the neighbouring plains and the liberty of movement. Of Germany's thirty largest towns, sixteen lie in the belt at the foot of the mountains. This line of Central German towns crossing the Lower Rhine from Aix to Breslau forms the heart of a zone of maximum density of population; while another strip of thickly peopled country, running in a nearly meridional direction, follows the line of the Rhine from Basle to the mouth of the Ruhr. If we were to try and draw a border line, which could be but an arbitrary one, between the mountain country of Central Germany and the North German lowland, the best way would be to follow the line of the projected canal from the Elbe to the Rhine. The eastern end of this line follows the most southerly of the great valleys (see p. 103), that one whose continuation beyond the Elbe carries us from Wittenberg along the Black Elster to Lusatia and through the marshes of Lower Silesia to the Oder in Middle Silesia. After that the border is marked by the Malapane. Between this northern boundary, whose western continuation runs pretty nearly along the line from Homburg to Maestricht, and the northern boundary of South Germany (see p. 242), described above, lies the central mountain country of the interior of the German Empire, an area of 56,000 square miles, with 23½ millions of inhabitants. In other words, the average density of population in this large district exceeds that of the Upper Rhenish lowland, the most thickly peopled part of South Germany. There are, of course, very great variations of density in both regions.

The Mountain Country of the Lower Rhine, its Valleys, and the Inlet of its Lowland.

On the southern border of the Taunus and the Hunsrück grow noble vines, that testify to the magical power of the sun by which the grapes upon the black schistose soil are ripened. Towards the west the yield of the vine diminishes with the rise of the land, but there, in the neighbourhood of the Saar, the coal-field of Saarbrücken, which extends into the Palatinate and into Lorraine, has given rise not to any large towns, but to a belt of populous districts whose mines supply, not so much derivative industries growing up at the pit's mouth, as the needs of a wide area extending into Switzerland and Italy. The transport is effected not entirely by railways, but partly by the little river Saar, which has been rendered navigable by canalisation. The freights of coal go almost exclusively up the stream to the Rhine and Marne Canal, not down to the Moselle. Treves stands in a hollow of the old schistose mountains, just where the Moselle begins to enter the higher country. Its greatness, however, belongs to the past, to the time of the Roman Empire, which regarded the preservation of the Rhine frontier as its most serious duty, and required a seat of rule behind the centre of that frontier. The possession of splendid Roman buildings from that period is the one title of Treves to fame.

Coblenz (Confluentes), situated in the heart of the mountains, about the middle of the Rhine's picturesque gorge, gains increased importance from the fact that, just above, the Lahn also comes to join the principal river in its fruitful valley basin. While the valley of the Rhine offers to our admiration not only its rocky banks, castles, little towns, and villages, but also an easy and actively utilised medium of traffic, nothing but small loads of building stone and ore are carried down by the Lahn, which travels past pleasant towns and the baths of Ems, whose springs are the most famous of the many scattered over the northern slope of the Taunus. Once again the Rhine adorns itself with all the charms of nature and of romance before emerging at Bonn into the gradually widening bay of flat country about Cologne.

The largest town upon the Rhine arose at the junction of a western highway from the Seine, Sambre, and Meuse, with a southern way which continued the road from Lyons to Treves through a depression of the Eifel. Cologne, at first an encampment of the Romans, then a town, became later on a royal seat of the Franks. The subsequent growth of Cologne was, however, owing rather to the draught of the river, which is here sufficient even for sea-going vessels of the smaller sort. The trade with England, begun as early as the eleventh century, raised it from the position of an archbishopric, "the German Rome" filled with splendid ecclesiastical buildings, and gave it strength to become a flourishing free community. As the port of the German Rhine country, it spread the net of its communications as far eastward as the lands extended which had been colonised by

Germans, and southward over the Alps as far as Milan and Venice, distributing not only foreign wares, but also the products of its own industry, and especially of flourishing spinning, weaving, and dye works. The sixteenth century brought a decay of the town's prosperity, owing to the disturbance of its communication with the sea during the Dutch war for freedom and to the rise of the free Netherlands. Impoverished and reduced, it was swallowed up by the French Revolution. Only on its inclusion in the State of Prussia did the town awaken to new life. The river front of the new and greater Cologne, which is six miles long, has been completely transformed by the construction of docks, which receive the rapidly growing trade and are in direct communication with London and with the most important sea-towns of the North and Baltic Seas.

The industrial activity which fills the suburbs of Cologne and the neighbouring independent towns on the right bank —in particular Mühlheim—is an outpost of the greatest workshop of German industry. No other district of the same size in Central Europe has a population of such great density. A territory of 1000 square miles, enclosed by München-Gladbach, Crefeld, Dortmund, Iserlohn, Remscheid, and Düsseldorf, may easily be marked out to contain nearly 3,000,000 inhabitants. The last forty-five miles of the course of the Ruhr are cut into the vast series of strata of a coalfield, and borings through the gradually thickening upper deposits have demonstrated that these beds continue northward on both sides of the Emscher as far as the latitude of Hamm. Of the 800 square miles of its total extent, 460 are being worked, and employ 150,000 miners. The coal obtained serves the needs of an important export trade. The great harbours of Ruhrort, Duisburg, and Hochfeld deal with larger quantities of merchandise (more than 10,000,000 tons) than any other inland towns of Europe, the greater proportion by far going up-stream. The Dortmund and Ems Canal has recently opened another outlet to the North Sea, and preparations are now being made to relieve the railways of their vast burden of coal by building a canal to the Weser and the Elbe. But however great the increase in the exportation of coal, the chief centre of its consumption will still continue to be formed by great manufactures carried on in the coalfield itself and its immediate neighbourhood. The immense ironworks between the Ruhr and the Emscher have, in twenty or thirty years, raised a few small old towns like Essen and Dortmund into cities of over 100,000 inhabitants and, assisted by a very close network of communications, have made them centres of the busy industry that prevails in the numerous lesser towns (Mühlheim, Bochum, Witten). The requirements of so large a body of population give rise in turn to fresh branches of production—the extensive brewing trade of Dortmund, for example. The statistics of motor-power would place the town of Dortmund, the twenty-seventh in the empire, in the second place, immediately after Berlin. Hagen, on the south bank of the Ruhr, is chiefly occupied with the processes of preparation of iron on a large scale. In the basin of the Lenne fine metal-work is carried on at Iserlohn and Altena, where not only is iron made into wire, needles, and pens, but there are also foundries of brass and German silver. The valley of the Wupper is filled with especially varied occupations. This little river makes a bend towards the north, and then, turning southward again, falls into the Rhine a little below Cologne, very nearly on the same latitude as its source. Some of its northerly reaches divide the two old towns of Solingen and Remschied, famous for their cutlery. The northernmost part of the curved valley, however, is occupied by the long line of the twin towns of Barmen and Elberfeld, for which their highly developed textile industries (cotton, wool, and mixed silk and cotton) have won the name of the "German Manchester." The western continuation of this valley leads to the town of Düsseldorf, on the Rhine, which serves as an outlet for its goods. Düsseldorf has become the seat of considerable and varied manufactures, and has not lost the agreeable aspect and gentle refinement of a little residence-town. As the home of the Academy of Arts, this place is the chief guardian of the ideal in an extensive district of prosaic utilitarianism. This is the only existing example upon the Rhine of an old centre of population having passed from one bank to the other. It is in a certain degree the successor of Neuss, an old Roman town (Novæsium) on the left bank, that lost its importance when the Rhine, which used to make a wide curve to the left and so touch it, had its course shortened and removed to a distance of two miles.

The considerable trade carried on in the neighbourhood of Aix-la-Chapelle depends upon its own supply of coal. In addition to ironworks, and zinc and lead foundries, there are extensive glassworks and a many-sided textile trade, amid which an old established cloth manufacture preserves its reputation in a modern form. How different is the life that fills this city to-day from that which moved about its springs in the Roman period, or that which filled the imperial palace and the court of Charlemagne.

Besides Aix, a number of busy lesser towns stand on the borders of the Lower Rhenish highland. A short transition, however, leads from this animated region to the thinly peopled Eifel. Here are districts where hardly a hundred persons can be reckoned to the square mile.

HESSE, THE WESER MOUNTAINS, AND WESTPHALIA.

Nature has not dowered the mountain country of the Weser so richly as the lands on the two sides of the Rhine, and has neither destined it to be the scene of such great political organisations nor the basis of so many-sided and important an economic life. Yet the heart of every German regards this country with deep and well-founded reverence. The abodes of the Chatti and the Cherusci form the original core of Germany; as far back as historical record reaches, they have always been and always remained German; no other race has ever gained a firm footing here, as the Romans and the French did on the Rhine, and the Slavs on the Elbe. The Hermann monument in the Teutoburger Wald, the grave of the German apostle at Fulda, and the imperial palace at Goslar all mark decisive turning-points in German history.

The part which Hesse played in it was determined by the divergence of the principal natural roads which open a communication across the hills between North and South Germany, and also help to connect Thuringia with the Rhine country. The two Hessian mountain masses, the Vogel Gebirge and the Hohe Rhön, both of which have been raised to a considerable elevation by volcanic flows of basalt, divide three lines of valley converging towards the north: that of the Wetterau, that of Central Hesse and that of West Thuringia. Through these valleys run three roads, marked out respectively by those reaches of the Upper Lahn which flow southward between Marburg and Giessen ; by the course of the Fulda ; and by the Upper Werra. These roads come from points far apart in the valley of the Main, and take a northward course that brings them together on the Fulda in the northern part of Hesse. The railway from Halle through North Thuringia goes directly towards the west as far as Cassel. To the west of this town, however, round Waldeck, lies an extensive mountainous district. It is turned on the south by an important line of railway, which at Giessen branches off from the line to Frankfort, and goes along the Lahn and Moselle to Metz, the farthest point of the Empire. The line that connects this frontier fortress with Berlin is crossed at Cassel by that which connects the principal towns of South Germany with the ports of the North Sea. Full advantage has only been taken of this position of Cassel as a junction of communications since its absorption by Prussia. The little country of Hesse itself was too poor in fertile land and mineral wealth to support a large town. Forty per cent. of its area is covered by wood ; the little mountain villages, in whose cottages the loom is heard rattling, are surrounded by wide stretches of meadow-land and pasture. The most favoured tract of the whole country is the valley of the Lahn, between the two cheerful university towns of Giessen and Marburg.

The upper reaches of the Weser are not enlivened by great traffic. Even the development of Minden in the Porta Westphalica, has remained strikingly inferior, not only to that of its eastern neighbours, the capital towns of Brunswick and Hanover, but also of a place whose situation is undoubtedly poorer, Bielefeld, standing away from the river on the road between Dortmund and Minden, and owing its rise to its being the principal seat of an old and famous linen trade. Like Bielefeld, Osnabrück lies just in front of a Teutoburgian forest pass, in the valley between these mountains and the parallel chain of the Wiehen Gebirge, lying opposite on the north-east; it has grown equally great owing to its many different branches of manufacture, which are supported by the neighbouring coalfields. Osnabrück is traversed by the road which passes easily through the end of the Weser Mountains from Bremen south-westward to the Münsterland. The capital of the "Red Earth" has gained new prospects since it was touched by the canal from Dortmund to the Ems.

Eastward of the Weser, in Schaumburg-Lippe and the province of Hanover, a belt of hill ranges rising directly from the lowland, the Bückeberg, the Deister, and the Osterwald, furnish abundant deposits of excellent coal. This is the chief source of strength for the great trade of Hanover, and gives wings to the traffic along a star of railway lines converging at this convenient spot. Hanover long remained a little town. It only began to increase when it became the capital of a secondary State. It was not, however, one of the royal residences that owe their existence to foolish caprice, and are fostered unnaturally at the expense of places in better positions. The eye of Henry the Lion chose this situation for a town with insight indeed, but also with good luck, for many of its characteristics did not become valuable until the nineteenth century. The name (Honovere) expresses the advantage of the high banks between which the Leine here flows. At a distance of fifteen miles from the border of the mountains it cuts for the last time through an island of solid rock which rises out of the loose diluvial ground, emits salt springs, and hides in its depths a bed of asphalt. The persistently meridional direction of the valley of the Leine was adapted to carry a main road running on the west side of the Hartz Mountains and connecting the northern lowland with Thuringia and South Germany. It was not, however, until the railway period that Hanover became the terminus of this road, and the crossing-place of the line from Cologne to Berlin with the line running north and south. The lively development of its traffic, and closely allied with that, the rise of its manufactures since the opening up of the neighbouring coalfields, have made Hanover—if Linden, which lies opposite on the left bank of the Leine, be reckoned with it as one centre of population—the fourth town in the kingdom of Prussia and the eighth in the Empire. It competes on about equal terms with Magdeburg, the point of departure for the eastern circuit of the Hartz Mountains, and has far outstripped Brunswick, which lying at the northern extremity of the chain at one time succeeded in drawing to itself the traffic from both sides of the mountains.

This westward displacement of the inland centre of trade between the Elbe and Weser is in part—though many other causes contribute to it—a reflection of the change that has made Hamburg instead of Lübeck the chief trading seaport. Brunswick's flourishing period was the epoch of the Hanseatic League. It shared with Danzig, Lübeck, and Cologne the honour of being a capital of one of the four quarters of the League. The decay of German commercial supremacy in the Baltic and the rise of the Netherlands put an end to the prosperous days of Brunswick. The principal foundations of its present more modest prosperity are the high culture of its fertile territory, the development of the sugar trade, and the opening up of its mineral treasures, which consist of salt, alkalies, and lignite.

The development of the chief towns in the northern foreland of the Hartz Mountains shows clearly how the main road and the centres of life were gradually shifted northward into the more open country. The oldest line of communication in the early Middle Ages kept nearer to the foot of the mountains, and has there left behind it towns in Hildesheim and Goslar, which in the antiquity of their memories, the character of their buildings, and the arrest of their development, contrast with the great centres of the foreland, in the same way as Halberstadt and Quedlinburg, in the neighbouring district on the east, contrast with the metropolis of the Middle Elbe, by which they are overshadowed.

The District of the Middle Elbe (Thuringia and Saxony).

The Elbe, which the Romans would like to have made the western boundary of free Germany, long remained, in later days, its eastern boundary. No part of its course was more important at the time when the Altmark and the adjoining part of Hanover were still in the hands of the Slavs than the solid high bank washed by the waters of the Middle Elbe at the point where it flows farthest to the west, between the embouchure of the Saale and that of the Ohre. Here, as early as the days of Charlemagne, arose Magdeburg, at first an extreme outpost of Germany. Later on it became a valuable support for colonisation to the east, a market for the trade of the Lower Rhenish manufacturing towns, and a powerful inland member of the Hanseatic League. The results of this long and strong development were annihilated by the destruction of the town in 1631. Magdeburg revived as a fortress of Brandenburg. The bridge-head of the rising North German power now looked to the west. Renewed prosperity only came with the nineteenth century. With the intensified cultivation of its fertile plain, favoured by the discovery of the alkalis at Stassfurt, Magdeburg became a great manufacturing and trading place, which received colonial produce, coal, and petroleum coming up the river, and sent down in exchange large loads of salt, manures, chemicals, and sugar. The development of the town outgrew the old belt of fortifications and created great suburbs beyond, which were only really incorporated with the original centre after the fall of the old defences. While the railway communications of Magdeburg, which has direct connection with five seaports, are not capable of further improvement, the water communications of the town will be largely extended when a canal opens a way to the Weser and the Rhine. Even now the great water traffic suggests that Magdeburg, with its magnificent river, holds the most advantageous place in the heart of North Germany in regard to the transport of goods.

The basin of the Saale offers an interesting spectacle in the rivalry of two neighbouring cities, Halle and Leipzig, lying in the same hollow of the lowland, which enters between the heights of Thuringia and the foreland of the Erz Gebirge in such a way as to make both towns equally eligible starting-points for communication with South Germany and with the valley of the Rhine. Here, along the Saale and the Elster, roads branch off to Bohemia, Franconia, and Hesse, the lines of all of them being clearly marked by openings in the mountains which allow them passage. As is well known, the crossing-place of these roads became conspicuous in military history on account of the number of battles fought there—1631, 1634, 1757, 1813. These were not only great in themselves, but also, owing to the locality, particularly decisive. The plain in the hollow of Leipzig is the most memorable field of battles on German soil.

Halle, in spite of the great charms and advantages of its situation, the fame of its university and the growth of manufactures, has not become a great city of the first rank, but has been distinctly outstripped by Leipzig, which lies twenty miles to the south-east. This is principally due to accidental historical circumstances. One of the chief of these was the dependence of Halle upon the archbishopric of Magdeburg, which was only temporarily lessened by its inclusion in the Hanseatic League, and another was the care bestowed on Leipzig by the enlightened Electors of Saxony. To these it was mainly owing that the Elster basin was enabled to emancipate itself from the absorbing power of the Saale capital, and to develop a still larger centre of population of its own. It is true that, compared with Halle, which rises on the north-western border of the lowland bay and close to the Mansfeld Hills, Leipzig has the advantage of standing more in the open centre of this bay, and also a little more to the south, so that it comes exactly into the continuation of the Thuringian main road from Erfurt to Naumburg, while Halle lies rather to the north, and so off the naturally marked cross-ways. The site of Leipzig, however, was by no means particularly favourable; it was originally the marshy strip of valley in which the Elster changed its course from a northerly to a westerly direction before falling into the Saale, and, being joined by other tributaries, particularly the Pleisse, twined itself into a network of continually changing water-courses. The town rises out of this low valley on an alluvial plain to the east, and a wide ring of great suburbs have arisen in the course of the nineteenth century, and have been incorporated within the last few years. Leipzig—the Linden town of the Wends, and now the fourth city of Germany—is a much newer place than Halle. Not until the thirteenth century did it begin to develop into a centre of trade, supported by valuable privileges. The year 1268 may be reckoned as the year in which Leipzig Fair was born. The foundation of the university, too, one of the oldest in Germany, in 1407, contributed largely to the advancement of the town, and prepared its reputation as a mart of learned productions, printing, and bookselling. The storms of war, indeed, exposed the prosperity of Leipzig to severe and repeated trials; but the promptitude and energy of spirit developed in the citizens by the protection of their trade privileges surmounted all such ordeals, and also prevented the efforts of Prussia to raise Halle at the expense of Leipzig from being entirely successful. In the course of the nineteenth century the old trade privileges of Leipzig have gradually become worthless, and the increase of general communication in the railway period has diminished the importance of its Fair.

Thuringia, the country from the Hartz Mountains to the Thuringian Forest, comprises tracts of very dissimilar characters. The northern border is formed by mountains rich in minerals and occupied by old established mines—the Upper Hartz, amid whose thick woodlands for many centuries little mining towns were at work digging deep into the veins of silver; the Lower Hartz with great deposits of iron ore; and the bare hill country about Mansfeld, which is the greatest seat of copper-mining in Germany, and has besides considerable wealth of silver. At the southern foot of the Hartz Mountains runs a fertile dip of land, the "Goldene Aue," through which passes an important line of communication between Halle and Göttingen, a town whose importance is older than its famous university. Nordhausen, the principal place of the Goldene Aue, sends out, along this busy road, not only the products of the fruitful country, but also the linen made by the poor weavers of Eichsfeld. Beyond, to the south of Nordhausen, begins the extensive shell-limestone plateau of Thuringia, a country poorly watered, with few trees and not very fertile. Its thinly peopled area is interrupted, however, by tracts of busier life, some due to little fruitful basins in which the limestone is covered by more recent deposits, and some to the main Thuringian highway, which accompanies the Werra on its passage across the threshold of the Thuringian Forest, passes down, by Eisenach and Gotha, to the basin of Erfurt, reaches the valley of the Ilm at Weimar, and following the direct continuation of it along the Saale, comes eventually to the edge of the lowland at Naumburg. The political sub-division of Thuringia has given birth to a number of very agreeable moderate-sized towns along this highway, two of which have secured an honourable place in the intellectual life of Germany—Weimar, as having been a fostering home of German literature, and Gotha, as being the seat of a renowned geographical institution. In the course of this rivalry no really large city has been developed. Erfurt comes nearest to being this; the extremely fertile basin in which it lies and the mildness of the climate have made it a centre of prosperous market-gardening, while in this same basin the road from Göttingen, which continues the course of the Leine valley over the threshold of the Eichsfeld, joins the main Thuringian highroad. On the south of this important artery of traffic, the flat shell-limestone formation extends monotonously again at the foot of the Thuringian Forest, but is deeply furrowed by the valley of the Saale. The name of Jena recalls the rural charm of the Thuringian university belonging to the comfortable little town with its picturesque framework of hills; but it recalls also the serious historic importance of the thoroughfares which come this way from the Main, round the southern end of the Thuringian Forest, and strike the valley of the Saale. Above Saalfeld the valley becomes difficult, narrow, tortuous, and deeply cut into the highland of the Franconian Forest. This highland may be regarded, both because of its extremely wooded character and because of the industrial activity of its inhabitants, as belonging practically to the same district as the Thuringian Forest.

Advancing northward from the slate quarries of Lehesten to the higher mountains, we first pass the circle of Sonneberg, where thirty places are engaged, on a system of minute division of labour, in preparing toys made of metal, stone, china, glass, wood, and papier-maché, for the markets of the world. Millions of dolls set out on their travels every year from these parts. A little to the north, glassworks are spread over both slopes of the range; one place manufactures nothing but glass tubes for thermometers, and another great establishment nothing but glass eyes of the most deceptive perfection. The eastern slope of the mountains, and in particular the valleys of the Schwarza, Ilm, and Gera, are the principal headquarters of the great porcelain trade of the Thuringian Forest. On a more northerly section of the same slope the people work in majolica and terra-cotta. The northern part of the western slope, on the other hand, contains iron and steel manufactures of old-established repute, the largest manufactories of arms in Germany, and an unsurpassed manufacture of hardware. Ruhla, at the northern extremity of the mountains, works meerschaum and amber, and carves pipes.

The Thuringian range is by no means a powerful barrier, indeed most of the minor States extend across the mountains. The cheerful capital of Saxe-Meiningen and most of its domains lie on the western slope in the valley of the Upper Werra, and Coburg, whose picturesque castle overlooks the tributary valley of the Main, belongs to Saxe-Gotha.

By way of compensation, the north-eastern corner of Bavaria reaches across the steep slope of the Franconian Forest into the district of the Upper Saale, which has Hof for its centre of traffic. This is the beginning of the Vogtland, the highland that falls away in soft gradations towards the north on both sides of the Elster. It is a tract of land rich in fine meadows, rather too high for intense cultivation, and favourable to the growth only of potatoes and rye. Mineral treasure of its own it has none. The coalfield, however, in the basin of Zwickau also furnishes the great textile industry of Vogtland, and has enabled it to expand a small home industry into a large one concentrated in considerable towns. Spinning and weaving, both of wool and cotton, as well as lacemaking and embroidery, are carried on in the towns of the Vogtland, and also in Gera and Greiz, the capitals of the two duchies of Reuss, but more particularly at Plauen, which gains an increase of activity from its position at the cross-roads from Leipzig to Eger, and from Dresden to Bamberg.

The mainstay of Saxon mining and manufacture is the coal-bed between Zwickau and Chemnitz, on the northern slope of the Erz Gebirge. Mining operations, which have to penetrate a thick covering of recent rock to reach the coal, are here busied with two coalfields: one at Zwickau, which is the heart of a crowd of manufacturing villages, and a second, farther to the east, at Oelsnitz and Lugau. A little north-east of these floats the smoky flag of Chemnitz, in the network of whose sooty streets dwells that closely packed army of workers which keeps busy the workshops where machines are built, cotton spun, coloured goods woven, and hosiery made. The textile trade, which preponderates in this principal town of the district, has other favoured homes to the north of Zwickau at Glauchau, Meerane, Crimmitschau, and Werdau. An area of 555 square miles is inhabited by 860,000 persons, and even in a much wider circle the vivifying influence is perceptible of that source of vital power which human industry here draws from the bosom of the earth. Urban settlements, however, rise from the longitude of Chemnitz to the highest summits of the Erz Gebirge; Annaberg flourishes at a height of about 2000 feet; and the highest townlet in the German Empire, Ober-Wiesenthal, has an altitude of about 3000 feet. The explanation of this density of population in a rough unfruitful highland lies not in the far-reaching influence of the coalfield on the border of the mountains, but in the after-results of the tin-mining and silver-mining which flourished in the sixteenth century, and attracted a great body of colonists to the Erz Gebirge who thinned its woods and penetrated to the very top of its ridge. When the mines were exhausted, the population that had gathered and multiplied applied itself to other branches of industry. Bobbin lace, passementerie, and many departments of woodwork provide subsistence for the inhabitants of spots so high up that agriculture ceases to be possible.

Few places in this whole belt of mountains, which was once famous for its mineral wealth, now carry on mining, the chief of them being Freiberg, the seat of a renowned mining academy. Many ships are still loaded at Pirna with the excellent building stone of the neighbouring sandstone quarries, and Meissen, once the important focus of German colonisation, is still famous for its porcelain manufacture. But both towns have had to yield their leading positions to Dresden, which has arisen between them, and was selected by the rulers of the country for its capital. Dresden is primarily a royal residence, and as such singularly well chosen. The adjacent mountains not only form an agreeable conclusion to the delightful valley prospect, with its framework of pleasant hills, gardens, and country-houses, but also supply a splendid building stone for those monumental edifices which are erected not only by the ostentation of vain despots, but also by the enlightened work of an age that requires ample facilities for communication. The beauty of the situation, the architecture with its mingling of coquetry and dignity, the many art collections made by the fine taste of its rulers, combine to make Dresden attractive not only to travellers, but also to wealthy people who desire a quiet and agreeable life and who settle here permanently. But beside the Dresden of the court, and the Dresden of the stranger who seeks his ease, a Dresden of industry is growing up, with a ring of suburbs and outlying districts. It is true, however, that many branches of Dresden's industry owe their origin to the brilliance, the good taste, and the pleasantness that belong to a cheerful royal residence and a favourite meeting-place of wealthy foreigners.

UPPER LUSATIA AND SILESIA.

When the express train has flown past the last country-houses of Dresden and dives into the sandy wastes and fir plantations of the Dresden Heath, it seems to the traveller as if a curtain fell and shut off the rich life of West Germany. We come into the comparative poverty of the east, into districts more recently civilised and less completely Germanised. The traveller from the west is reminded that this is so by the chance words of Wendish that fall upon his ear in the station of Bautzen. The mere persistence of this island of Wendish speech is enough to show how quietly this country on both sides of the Spree has for centuries lived.

Görlitz, the capital of Lusatia, at the crossing of important lines of communication, fringes the banks of the Neisse valley, cut deeply into the granite block at the base of the basalt column of the Landeskrone. In spite of the administrative division the feeling of the people still regards Lusatia as an independent entity. Silesia proper does not begin until the other side of the Queis.

This province of the Prussian State pushes itself like a peninsula between Bohemia and Poland. The presence of foreign tariff frontiers on each side hinders the full development of many departments of its progressive economic life, and gives additional value to that improvement of the Oder which has in the last few decades made it a waterway of considerable value, and rendered communication possible with the centre of the State and with the distant seas. The mountains, rich in wood, but with no great store of minerals, are the seat of industries that are assisted by the motive power of the mountain streams, an assistance the value of which will continue to be extremely variable so long as reservoirs do not exist and assure a more constant water supply. Glass furnaces, sawmills, and wood-pulp factories are eating up the woods. Hand-weaving maintains a precarious existence in the poor mountains. But the transference of the whole textile industry to machines and to large manufactories is irresistibly completing itself. Its development follows the attraction of the coalfield of Waldenburg, which has caused densely inhabited villages and bustling work places to press in between steep wooded mountains. Small industrial towns at the more important passes and in the little hollows among the mountains form centres for the general life of the inhabitants. The main lines of communication, however, have from ancient times kept to the outer border of the chain, reaching the fertile middle Silesian plain, at Liegnitz, and the Oder at Breslau. The old capital of Silesia rises here in the centre of a plain which is very highly cultivated, and is the great eastern centre of beet-growing and sugar-making. The town stands at the junction of roads through the mountains, the line of which is fixed by the passes, and of roads in the plain, which are guided to this point by the course of the Oder and some of its tributaries. In the fourteenth and fifteenth centuries Breslau lay on the extreme border of European civilisation. In its markets convoys of goods from the Netherlands and South Germany met those from Hungary, Poland, and Prussia. The merchants of the city carried the products of the west and of their own industry far out into Eastern Europe, and on the other hand were in direct communication with Venice and Bruges. In the sixteenth century the independent development of Poland lessened the value of the old trade privileges which had combined with its position to give Breslau so leading a place in European commerce. The later advance of the town, in the nineteenth century, rested upon other grounds. Breslau was now the centre of commercial life in a large and productive province, the railway lines of which converged upon it. The fact that the river was not navigable for large vessels above Breslau made this the haven of the province, and favoured the development of busy manufacture as well as the agglomeration of population. Latterly, however, as the means of communication increased, the province began to depend less and less upon the centre. The canalisation of the river upwards to Kosel has made that the shipping-place of Upper Silesia, while the telegraph and telephone bring the industry of the province into direct relation with the centre of the Empire.

An extensive wooded territory close to the frontier of the Empire, which was formerly divided among a few large landowners, and had in the eighteenth century but a rare and poor population living in wretched villages and small towns, has become—since the opening of a coal-bed which surpasses in richness even that of Westphalia—the theatre of immense manufactures, which, having at command the unusual combination of coal, iron, zinc, and lead, have sprung up quickly and in great variety. More zinc is obtained here than anywhere else in Europe. The local supply of iron, which is not of great value, does not suffice for the iron trade, but the low price of coal makes it possible to bring better ore from far away, in spite of the distance from great markets and great waterways, which is disadvantageous alike to importation and to exportation. The gathering together of forges round the coal-pits has caused a great increase of population, and has created industrial towns like Königshütte in the course of some twenty or thirty years. In a triangle between Tarnowitz, Myslowitz, and Gleiwitz there are 659,000 persons dwelling in a territory of 232 square miles. The streams of the country-side have run away into the pits of the mines, where the water gets mixed with acids and becomes unfit for use, so that the vast population is supplied with water by a great system of artificial channels from the springs in the neighbouring chain of heights to the north. Close by this busy ant-hill of workers lie wide expanses of woodland—the coal-beds of future mines—divided into the preserves of great landlords.

Note on Authorities.—Germany is a great field of experiment for the methods of comparative geography.

While the brilliant work, *Bavaria* (five parts in nine volumes), 1862–68; *Das Königreich Würtemberg* (3 vols.), 1882–86; *Das Grossherzogthum Baden*, 1885; and *Das Reichland Elsass-Lothringen* (in progress since 1894) have been produced by the co-operation of many learned men working upon a large scheme, individual geographers have written single-handed books; W. Götz upon Bavaria (1895–1901), Fritz Regel upon Thuringia (3 vols., 1892–96), and J. Partsch upon Silesia, 1896–1903.

A variety of details may be found in the *Forschungen zur Deutschen Landes-und-Volkskunde*, set on foot by R. Lehmann in 1886 and published since 1888 by A. Kirchhoff. Up to the present time 14 volumes have appeared.

CHAPTER XVII

NORTH GERMANY

As we leave the mountains and hills, the character of the landscape becomes more monotonous. The richly ornamented cathedrals of the Danube and the Rhine give place to the sober brick façades of public buildings in North German towns of the open lowland, and the paving of the lesser country towns, even at the present day, exhibits the "cats' heads" (cobble stones) belonging to the rounded diluvial rubble, which were at one time the only material available for making solid causeways, even in large towns. To the agriculturist, too, this wide loose plain seldom offers fertile loams, with their abundant supply of nourishment, or rich marshlands; sterile sand and heaths that defy cultivation generally prevail.

The land for which the German colonists, always pushing forward, struggled so manfully, first with the older inhabitants, and then with its own unkindly nature, was poor, and in its original condition of wilderness even repellent; but it has been made, not indeed into a paradise, but into a dwelling-place that responds not ungratefully to the strenuous labour of an endeavouring people. There are considerable expanses only fit to grow trees, with which, indeed, large connected tracts on the east of the Elbe and others in the Altmark are covered, but as we approach the North Sea the woods grow thinner and thinner, and their place is taken by barren heaths and marshes. The existence of these almost uninhabited districts must of itself reduce the average density of population. This is much lower than that already given for the districts lying along the mountains of Mid-Germany, notwithstanding the fact that the two greatest centres of population in the Empire throw their weight into this scale. In Berlin-Charlottenburg, with the thickly peopled environs, and in Hamburg-Altona are to be found above three millions of the total nineteen and a half millions of inhabitants who share the immense area (102,100 square miles) of the North German Lowland. Its totality is naturally divided into three parts:—the shore-land of the two German seas, the intermediate district of the great valleys, and the southern ridge of land at a distance from the seas.

THE GREAT VALLEYS.

The southern border of the lowland, from the Malapane to the Droemling and the Aller, is pretty sharply marked by a series of valleys. Sometimes the entrance into a thinly peopled district on its northern side is rendered particularly striking by a wide strip of barren woodland; this is the case in Upper Silesia, in the Heath of Lusatia, in Lower Silesia, and along the south of the Altmark. On the other hand, the roads from Breslau and Wittenberg, which are important crossing-places of rivers, lead directly through ploughed lands and numerous villages up to the dry heights of the southern ridge of land, where a rich variety of cultivation is exhibited —orchards, fields, and considerable forests. The final section of this ridge is the Lüneburg Heath, an undulating plain scantily populated and better adapted for sheep-grazing than for agriculture.

The southern of the great valleys (p. 103) is not favourable to longitudinal communications; swamps and ponds fill some reaches of its ground. Towns indicate the crossing-places of rivers and swamps. Such are Glogau on the Oder, Cottbus on the Spree, Brandenburg on the Havel, once the strongest river-castle of the Wends. Standing opposite to Magdeburg, it so effectually dominated the entrance to the Marches of Brandenburg and the communications of their western parts, that the Margraves chose it for their residence. Since it ceased to be a capital and a bishopric, it has become a provincial town, whose exterior still preserves old memories, but of which the present life is dominated by manufactures, especially by the weaving of wool.

The second great line of valleys, that from Warsaw to Berlin, possesses for the greater part of its extent no towns. To the prosperity of Warsaw, which lies at its eastern end, it contributes nothing. The crossing-places of the roads in Poland and Posen are wretched hamlets. The more amazing is the appearance of Berlin in this valley line, which continues on the other side of Spandau with broken and thinly peopled country as far as Havelberg.

The most northerly valley, which runs along the southern foot of the high Baltic ridge, possesses a trading town of old-established reputation in Thorn. It was at this point that the mediæval lines of traffic which came up the Vistula and along the shore divided, to carry the goods brought from the sea to Frankfort, Breslau, and Cracow. The Vistula was the main artery of life to this town, and so it is still. But for want of care the upper Russian reaches have lost some of their importance, while towards the west the ancient channel, where formerly the original Vistula, now the Brahe, Netze, and Warta run, has once more been revived and made of use by means of the canals constructed by the Prussian Government. The greater part of the vast quantity of timber floated down from Russia takes its way westward into the district of the Oder. On this canal a serious rival of Thorn grew up in Bromberg.

When, however, we leave these old valley lines of the diluvial period, fallen in our present system of water-ways to mere tributaries, and we turn to the newer water-courses which run northward and connect the old valleys, we find no great town in the interior of Eastern Germany, but only the secondary towns of Frankfort and Posen, both of which lie upon the line of the old roadway. The ancient capital of Great Poland occupies a central position between the Bartsch and the Netze. Within this outer framing an inner square is formed in the immediate environs of Posen by the waters of the Warta, the Obra, the Warta again, and the Welna, while various other streams run close to the city. By means of this natural water-fortress the ancient kingdom of Poland long made head against advancing Germany, until indeed the capital was again removed in 1296 to the Vistula in order to be nearer to the advancing eastern frontier. But even after this, Posen, which had been turned by German immigrants into a real town, remained an important and populous place at the crossing of busy trading roads. It fell into decay only with the fall of the kingdom of Poland. Now, cared for by an enlightened and honest Government, it is quickly recovering as the capital of a province whose excellent soil distinguishes it most advantageously from the Mark. As an important junction of the communications of all the eastern parts of the Empire, Posen is strongly fortified. In regard to ideal matters, too, it is an important outpost of German civilisation.

Communication between Posen and the Elbe district was originally carried on by way of the lowland bay of Leipzig and the main Thuringian highway. Since the middle of the thirteenth century, however, the more northerly road between Magdeburg and Posen, by the passage of the Oder at Frankfort, has gradually come to be preferred. For some hundreds of years Frankfort-on-the-Oder succeeded in making itself the terminus of the trade that came up that river from the sea, and also in securing, for a considerable extent of the river, the monopoly of passage for traffic to Poland. This position of predominance was only undermined in the seventeenth century by the opening of a canal between the Oder and the Spree, and by the complete emancipation of navigation on the Oder. Up to the nineteenth century, however, the fairs of Frankfort remained favourite meeting-places of East German and Polish traders. Manufacture in these days compensates it for many of its commercial losses; the smelting of iron and the manufacture of machinery are largely carried on, the raw materials being brought up by the river and by six lines of railway.

Westward of Frankfort the diluvial plateau, whose extensive area on the east of the Oder offers a large connected tract of fertile loam for agricultural use, grows narrower, and is at the same time more broken up by lines of valley. Loose masses of sand growing nothing but Scotch firs, and valleys of marshy character become more and more prevalent as we approach the Elbe, in the immediate neighbourhood of which we find only a few islands of fertile diluvial country rising from the wide meadow hollows through which the Havel takes its winding course, often widening out into lakes. But before the traveller comes to the cheerful shore of the Havel and the changing pictures mirrored in its waters, the train, which for an hour before has carried him chiefly through dark woods, brings him suddenly to the capital of the German Empire, which seems to have been set down by some spell in this poor and sandy country.

BERLIN.

The fortunes of Germany have been powerfully affected by the circumstance that none of its districts had by nature and position a supremacy which secured the unity of the whole and its rule from one particular point. Not by an edict of nature, but by fierce struggles that have determined the course of history has the new empire gained what the old lacked—a capital.

The position of Berlin is, nevertheless, not devoid of geographical interest. If, however, we desire an impression corresponding to all the facts, we must content ourselves, in judging the choice of the spot, with a very narrow horizon, and then afterwards consider how enlightenment and energy have been able so to utilise and develop the situation that it satisfies the demands of one of the world's great cities. The Mark formed a border-land of the old empire, gradually spreading towards the east. Its seat of government changed with its eastern frontier. From Salzwedel it was moved eastward in 1141 across the Elbe to Brandenburg, the name of which is rightly borne by the country that forms the core of the monarchy. It still grew quickly eastward, and extended beyond the Oder. But internal troubles caused the capital to be once more withdrawn to the left bank of the Elbe at Tangermünde. Yet the double town of Berlin-Kölln was already in existence, and enjoying a modest prosperity as a trading-place on the right bank of the Spree, and on an island that facilitated the crossing. Possessing chartered privileges, the town became, thanks to its central position, the head of a little league of towns in the Mark. This period was cut short in a very surprising and unpleasant manner by the second of the Hohenzollern Electors, who in 1442 repealed the ancient rights of Berlin and Kölln, and in 1451 built himself a castle between the two towns. From 1491 onward this castle was the permanent abode of the rulers of the Mark, with whose fortunes Berlin was thenceforward closely related.

Lying midway between the two parallel rivers of the Elbe and the Oder, in the centre of the old valley—only partly filled by the Spree—that connects them by means of a diagonal to the north-west, Berlin was very well adapted to be the meeting-place of all the interior lines of traffic of the Mark. But its situation gained a more widely reaching importance when, in 1668, the Great Elector opened the canal between the Oder and the Spree, which made Berlin the centre of navigation between Breslau and Hamburg, and created the main diagonal of water traffic in North Germany.

At Berlin cross the world's great roads from Paris to St. Petersburg, from London to Odessa, and from Stockholm to Rome, while the greatest continental railway of the world, which crosses the whole mainland from Lisbon by way of Moscow to Vladivostock, has one of its principal stations at Berlin.

Berlin is the greatest manufacturing town of Central Europe. The beginnings of its industrial activity go back to the time when the Great Elector settled the French refugees here, whose western civilisation was advantageously grafted upon the strong race of the

Mark. The greatest strides in its progress, however, belong to quite modern times.

Of the wage-earners of Berlin, 53 per cent. are engaged in manufacture and 24 per cent. in trade, or upon the various means of communication. Of the total of those who are employed industrially, 31 per cent. are engaged in the clothing trades, in which Berlin has gradually gained a position for itself apart from the lead of Paris; 12 per cent. are engaged in a machinery manufacture which not only supplies every department of practical life, but has also a world-wide reputation for scientific instruments of precision.

Very considerable assistance is given to Berlin in its economic struggles by the activity of scientific life, which by its inventions opens new ways in many departments of industry, and secures constant employment to others. The Technical College at Charlottenburg is a bright example of the economic productivity of intellectual studies. Nor will the observer who is accustomed to look deeply into the development of nations and into the ways in which they forge their own fortunes forget the University of Berlin. There is no branch of knowledge in which this university has not, at one time or another, taken a leading place, and long and profitably retained it. From 200,000 in the year 1808, Berlin has increased to a population of 1,888,000. Nor is this all. Like planetary bodies, capitals cast off fragments of population which, sometimes with specialised functions, lead a life of their own. The towns of Charlottenburg and Schöneberg, though they continue to be separate municipalities, are now in direct contact with Berlin, and so are many villages of an urban character, one of which, Rixdorf, has 90,000 inhabitants. The whole ring of suburbs that surrounds Berlin and derives light from it as a centre, adds more than 700,000 persons to the number of the capital's population. This includes the two old towns of the Havel, Spandau and Potsdam, which have been completely enclosed within the precincts of Berlin. The junction of the Havel and the Spree afforded to Spandau a position which, in the Middle Ages, was secure but not very healthy. It is now the central military storehouse of the Empire, and has great arsenals and workshops for the manufacture of arms and ammunition; the imperial military treasure, too, is kept here. Potsdam, on the other hand, which lies amid the parks belonging to the castles of Sanssouci, Babelsberg, and Glienicke, is a quiet and pleasant royal residence. The great pools of the Havel lakes, the clumps of trees in the pleasure garden, with the castles peeping out between, breathe rest and peace and invite to the easy enjoyment of an honourable leisure.

THE GERMAN COUNTRIES OF THE BALTIC.

The varying struggles of nations for existence, the rise and fall of their importance, leave traces in the alterations of their national and political boundaries. The most important peculiarity in the outline of the German Empire, and one which must influence its future destinies, is the imperfect correspondence between the extent of its inland territory and its coast-line. To the west, the delta of the Rhine has become politically separated, so that the mouth of the largest German river lies in foreign hands. On the other hand, the results of German mediæval colonisation have so far maintained themselves, that the lower reaches of the Vistula and the Niemen, the rivers of Poland and Lithuania, are ruled by their German inhabitants. The development of East Prussia and Dantzig is impeded by the manner in which they are, as it were, embraced by Russia; they are cut off from the "hinterland" by the tariffs of a power whose aim is to isolate herself as far as possible, and other obstacles besides the unfavourable climate are thus put in the way of progress in this portion of Germany. Finally, the German duty on wheat helped to drive the most important product of Poland and Lithuania, which at one time had poured abundantly into Prussian ports, to the ports of Russia, especially to the rapidly rising Libau. The rivers, in these days, when free from ice, carry down a vast quantity of timber, but scarcely anything else. The towns which suffer most severely from being thus shut off from the "hinterland" are naturally those of the Niemen: Tilsit, which, while the old system of roadways lasted, was an important crossing-place at the narrowest point of a valley that is in most parts very broad, and also liable to be widely flooded; and Memel, which stands at the sole outlet of the Curische Haff.

Königsberg, situated between the two Haffs of East Prussia and able to communicate with both, enjoys a larger sphere of influence, while it dominates the low heights of the coast as far as the amber shore of Samland, and also the fertile tract of land at the foot of the Baltic ridge. Its access to the sea was imperfect until the Königsberg Sea Canal was carried across the Haff between moles. Now ships of more than twenty feet draught come into Königsberg, which lies twenty-five miles from the sea. The opening of a free port here will contribute to increased activity of trade. The importation of coal by sea and of wood by river helps to keep up some manufactures which mainly serve the needs of the province, and so do not profit much by the fact that the town is on the main line to the capital of Russia. The efforts made to improve the place have succeeded in making it the largest of the German towns on the Baltic, and its university is the centre of intellectual life in the North-East German provinces.

The farther south we go from Königsberg, the less populous the country appears until we reach the extensive wooded district of Masuria, the large lakes of which are connected by watercourses with one another and with the rivers of Poland and Prussia. The population sinks here to less than 100 to the square mile. Severely schooled by stern nature, one of the sturdiest races of Germany has grown up in East Prussia, a race which left a never-to-be-forgotten example of self-sacrifice and patriotism at the time of the war against the Napoleonic tyranny.

The valley of the Vistula carries a tract of fertile, well-cultivated land across Prussia. The district lying between the two branches of its estuary, one of which falls into the southern corner of the Frische Haff and the other into the Gulf of Dantzig, is in particular one of the richest pieces of wheat-growing land in North Germany. Here there is a dense population, ready to protect the dikes if the swollen river should threaten their hoped-for harvests. Close by arose the most prosperous towns of West Prussia. The railway from Berlin to Königsberg crosses the branches of the dividing Vistula at Dirschau and at Marienburg, which stands on the high right bank of the Nogat and was the earliest seat of government of the Teutonic Order ; it then, before approaching the Frische Haff, runs at the edge of the rich marshes that have filled up its south end, and passes the great ship-building yards and machinery workshops of Elbing, a place which, by means of the river of its own name and the Oberland canal, carries on a busy trade with the lakes in the southern hills, and has always made efforts to obtain a share in the sea trade too by means of the Frische Haff. In this respect, however, its neighbour on the west, Dantzig, is incomparably better situated.

If we enter the main street of Dantzig, buildings of the fifteenth and sixteenth centuries at once speak of the prosperous time when it was a free German town, the port of the Polish kingdom, and the entrance for all trade by sea with the whole district of the Vistula. Its inclusion in Poland unavoidably involved the place in the downfall of that kingdom. Impoverished and enfeebled, it fell at last into the hands of Prussia, and pressed upon not only by the nearness of the Russian frontier, but also by the competition of Königsberg and Stettin, has but very slowly gained fresh strength. Natural causes also interfered. The Vistula, which formerly conducted its main stream past the north side of the town and fell into the sea to the north-west at Neufahrwasser, broke through the dunes on the east at Neufähr in 1840, and made itself a new mouth at some distance from Dantzig. Engineering skill succeeded in drawing an advantage even from this catastrophe. The old arm of the Vistula was now closed near Neufähr by a sluice-gate, retaining high floods and floating ice; its eastern reach was turned into a great harbour, and its western into a sea-canal by which ships could come up from the outer port of Neufahrwasser, while the little river Mottlau which runs through the town was deepened by dredging to fourteen feet, and boats were enabled to come actually into the town itself. Recently this arrangement was even better secured by removing the high waters of the Vistula yet more to the east through a canal piercing the dunes by the shortest way.

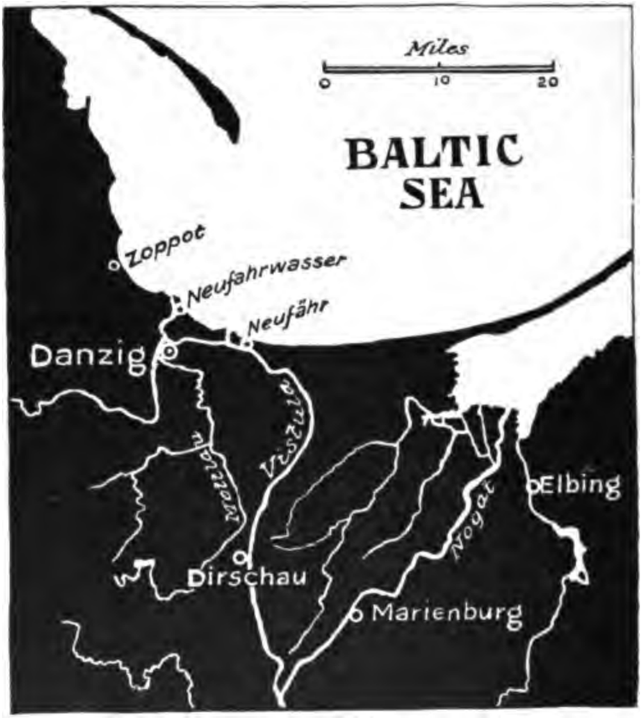
Miles
0
10
20
BALTIC SEA
Zoppot
Neufahrwasser
Neufähr
Danzig
Vistula
Mottlau
Nogat
Elbing
Dirschau
Marienburg

FIG. 37.—The Delta of the Vistula.

But all these efforts have not succeeded in raising the sea trade much above that of Königsberg. The inland waterways have been completed by the Vistula and Haff merce, however, has made no great strides in the last few decades, manufactures have greatly developed. Shipbuilding, machine-making, and a whole series of trades that deal with the preparation of agricultural products are especially flourishing. The sea-shore, which still lies at a distance of three miles from Dantzig, is bordered by friendly little suburbs, sea-bathing places, which are the last in that line of visitors' resorts that animate the Prussian coast and the outlying tongues of land in summer-time.

Swinemünde is the busy outer port of Stettin, which lies on the inner shore of the Haff, planted high on the left bank of the mouth of the Oder, and continually extending. Both sides of the river are covered by a number of suburbs with busy factories, which if they were reckoned in would make Stettin the largest centre of population (200,000 inhabitants) on the German shores of the Baltic. Stettin, the most southerly of all the Baltic ports, is the most important trading port of the kingdom of Prussia, the gate of that river basin which falls most completely within the territory of the monarchy, forming the solid kernel around which the other provinces were drawn together, at first loosely and then in firm union. The possession of this place was of fundamental importance to the growth of the State. Stettin has prepared itself by means of new docks for the further increase of its maritime relations. Besides acting as a port for the commerce of Berlin and of four productive provinces, Stettin has a lucrative trade of its own. In Continental shipbuilding the "Vulcan" yards take a high place. Great cement-works, too, send their products to a distance. The mills, breweries, distilleries, and sugar-factories of Stettin are the principal destination of the agricultural products of Pomerania.

While the estuaries of the great rivers encourage a concentration of inhabitants in the three great towns of the three old Baltic provinces of Prussia, the more divided western shore of the German Baltic, with the "bodden" and creeks of Western Pomerania, Mecklenburg, and Schleswig-Holstein, shows a greater number of moderate-sized towns, most of them old and formerly strong members of the Hanseatic League, competing one against another. The towns of Hither Pomerania, a fertile district in which agriculture is profitably carried on, fall rather behind in this rivalry. Rostock, the most flourishing sea-town of Mecklenburg, reaps an advantage from the circumstance that the southerly projection of Falster lies just opposite. By way of Rostock a crossing of twenty-eight miles of open sea between Warnemünde and Gjedser suffices for the quickest possible communication between Berlin and Copenhagen. Rostock's own active shipping trade and shipyards give it one of the first places among the German ports on the Baltic. It is the largest town in Mecklenburg. Schwerin was preferred to it in earlier times because of its position between the lakes of the interior, which would have been difficult of attack, and the charms of its scenery fitted it to be a pleasant little royal residence, but a centre of traffic it could never have become.

If we consider the outline of the Baltic Sea on the whole, we must perceive that the south-western angle has a peculiar importance. It is the end of the principal axis of the long basin ; it comes nearest to the basin of the Elbe and to West Germany, which were early civilised. Here Lübeck on the Trave, flourishing as long ago as the middle of the twelfth century, was the chief city of the German Hanseatic League, and mistress for a lengthened period of the Baltic Sea and of the trade that dealt with the produce of its fisheries and with the raw material of adjacent countries. Lübeck continued to hold a position of privilege in the world as long as an impulse towards the east ruled West Germany's spirit of enterprise, and as long as the thinly peopled countries of the Baltic opposed but a passive resistance to German exploitation of their treasures. When trans-oceanic discoveries made the Atlantic and the North Sea the theatre of navigation on a larger scale and to remoter ports, the Scandinavian nations rose to greater economic independence and political strength. Then the star of Lübeck set. Its prudent citizens, however, managed to maintain an honoured position and to attract a considerable trade. They deepened the little river Trave, so that ships of five metres' draught can come up to the town instead of stopping at Travemünde. By building the Elbe and Trave canal they have lately improved the connection by water with the Elbe, originally opened in 1398 by means of the Stecknitz Canal, the oldest in Germany, and in spite of the difficulties that beset a little republic standing among larger neighbours who pursued their own interests, Lübeck has also succeeded in getting advantageously linked on to the North German railway system. The town has thus, not indeed advanced so rapidly as several of the Baltic ports in the Prussian domain, but preserved a respectable importance. Its Baltic trade reaps a natural advantage from its having all Western Germany as its hinterland. In this respect Lübeck remains superior to the ports of Schleswig-Holstein, which have only a narrow strip of peninsula behind them.

Kiel alone lies sufficiently to the south to compete with Lübeck, but the importance of this beautiful Holstein port now rests upon other grounds. As the great naval station of the German Empire, Kiel, which was once a quiet little university town, has advanced with rapid strides. The improvements which have been made in the military interest are also of service to its commerce. This is particularly the case in regard to the construction of the North Sea Canal, which transfers to Kiel some part of the old and long misused privileges enjoyed by Copenhagen as the gate of the Baltic.

A journey along the German shores of the Baltic leaves behind some impression of the historical and economic importance of this sea. In the nature of things, the eastern ports of the Baltic are particularly eager for ocean trade. Of the vessels that land on the shores of East Prussia, 48 per cent., and 71 per cent. of the whole tonnage, come from waters outside the Baltic. In Lübeck these significant figures fall to five and eleven respectively. In the old Hanse town, which was once mistress of the Baltic trade, the impression of the Baltic as an enclosed sphere of commerce still remains alive. And, indeed, when we consider the whole circle of the Baltic, we cannot deny that its enclosed character does limit not only the nature of its waters—their saltness, their slowness to freeze, and their response to the pulsations of ebb and flow—but also the vitality of its trade, and that in regard to time, space, and intensity. Although the Baltic coast of Germany is fully double as long as its North Sea coast, the latter has three times as many vessels, five times as many sailors, and six times as large a tonnage.

Nor can the sea-fishing of the Baltic compare with that of the North Sea, at least since the time when the herring-fishery, which we are assured on good authority used to be pursued off the coast of Scania, changed its place for the benefit of the Scotch and Norwegian shores. Fish, however, still continues to be an important factor in the earnings of the people of the Baltic coasts, and to supply a profitable trade, which not only provides the inland market with smoked and salted fish, but since transit has been so much quickened and perfected, sends fresh fish, alive or in ice, through long distances. Elbing lampreys, Pomeranian flounders, and Kiel sprats are widely esteemed. The herring especially forms an important element in the food of the people throughout a wide area.

THE GERMAN COUNTRIES OF THE NORTH SEA.

The traveller who crosses Schleswig-Holstein from the Baltic to the shores of the North Sea, and expects to pass immediately into a region of active international trade and rich life, will find his first advance disappointing. The whole peninsula turns its face decidedly to the Baltic, whose waves and whose trade it receives with wide-opened arms of land, taking them into cheerful and safe bays, while the west side of the country is beaten, torn, and swept by the wild winds and turbulent waves of the North Sea. Only in the summer and early autumn are the bathing-places of Sylt and the neighbouring islands peopled by landsmen, who come here for a few weeks to listen to the regular beat of the mighty waves, and to refresh themselves in the sea-foam before returning to the long and enervating imprisonment of their working places. During the greater part of the year stillness prevails upon these islands and the shores behind. Their "geest" country is not fertile, and is thinly peopled. Farther to the south there comes a strip of rich marshland sheltered by a dike, where cattle are fattened, and agriculture is profitable. But it is not until the estuary of the Elbe that the tide rushing in opens a gate to the commerce of the world.

The river Elbe is bordered by low marshes with protecting dikes for nearly sixty miles from its wide mouth. Then, on the right bank, at Blankenese, the high bank of the diluvial tableland appears, close to the river, its hills covered by gay gardens and country-houses. Here, between the arms of the North and South Elbe, which presently reunite, begins a region of islands, intersected by variable watercourses. This alluvial district, however, lies within a firm framework; eight miles above Blankenese on both sides of the valley—which at Harburg and Hamburg is only six miles wide—the high "geest" country comes close up to the South Elbe on the one hand, and to the North Elbe on the other. Here was a crossing marked out by nature, for the valley widens out again farther up. Even in the time of Charlemagne the Franks had secured the right bank. There Hamburg arose at the mouth of the Alster. In a position threatened on three sides its existence was long insecure; it was burnt now by pirate Northmen, now by the Wends, now by the Danes. It was not until the twelfth century, when the German frontier was advanced, that tranquil development became possible, and new strength was given by the immigration of the citizens of Bardowik, a trading town higher up the river, which had been flourishing upon the next crossing-place of the road from Lübeck to Lüneburg, and was destroyed in 1189. In the thirteenth century the Alster was dammed up for the benefit of the mills, and one of the most charming features in the landscape of the town, the lake of the Alster basin, was artificially formed. This sheet of water gave security to the place, and the alliance with Lübeck, which formed the germ of the great and progressive Hanseatic League, gave it an opportunity of increasing its power and its possessions undisturbed. But it long remained a Hanse town of only the second rank. It was the discovery of America and the increase of activity on the Atlantic that gave Hamburg its growing prosperity, while Lübeck fell into the background. Active communication was entered into with England; and although Germany remained excluded from trans-oceanic colonisation, yet Hamburg's spirit of enterprise found openings that were both attractive and remunerative, first in the trade of Brazil, then in the whale-fisheries of Spitsbergen. The most decisive circumstance in the trading relations of Hamburg was the rise to independence of the English colonies in North America. The violence of the Napoleonic period indeed interrupted this hopeful course of progress, but in the nineteenth century it continued in a brilliant manner.

The embouchure of the Bille and that of the Alster open out into wide gulfs, and afford an opportunity for the formation of excellent basins from which canals (the "Fleets") run between the lines of houses and warehouses. But trading vessels lie even in the middle of the river loading or unloading by the assistance of flat-bottomed boats plying to and from the bank, and a picture of confused animation is presented such as can be matched nowhere upon the Continent. The unexpected strides made by trade in the last twenty or thirty years have rendered all the earlier arrangements inadequate. A vast rearrangement of the whole harbour was undertaken in 1882, when Hamburg decided to join the German Customs Union, and only to retain for the future a certain clearly marked off portion of its shore, waters, and islands as a free port. A space of nearly four square miles, mainly opposite to Hamburg, on the south bank of the North Elbe, has been laid out as a free harbour, which in addition to the roomy basin with its long quays, appliances for loading, railways, and extensive warehouses, contains great shipbuilding yards and other workshops, but no dwelling-houses. Other basins and canals more closely connected with the town serve the traffic, principally such as comes down the river, that passes under the Customs Union and moves within its rule.

Hamburg does not confine itself to acting as an intermediary for the exchange of Germany's products with those of neighbouring countries, and even of remote zones; it undertakes a great part of the manufacture of the raw materials brought into it and passes them on in their completed state to the places of their consumption. Factories in which coffee is roasted, chocolate made, rice peeled, palm-oil and ground-nuts worked to soap, deal with tropical products, while raw materials from North America are worked up in grease refineries and margarine factories, and wheat from the other side of the ocean is ground in steam-mills. The vast shipping trade not only employs the yards, but gives work to a number of trades that supply various ship fittings or necessaries for the crews. Thus, in this greatest commercial town of the Continent, the proportion of persons engaged in productive industries (which is 43 per cent.) surpasses that of persons engaged in commerce and traffic (39½ per cent.).

The river brings down sugar, salt, alkalies, timber, stone, and also coal, and carries up wheat, meal, colonial wares, nitrate of potassium, and, above all, petroleum. In bulk English coal and wheat exceed all other goods brought by sea; saltpetre, iron, and petroleum come next, and colonial produce only after these. But in value coffee stands far ahead, and sometimes accounts for one-eighth of the total sum. Then follow wheat, wool and cotton, hides and skins, saltpetre, ores and pig iron, other metals, materials for dyeing and tanning, oil-seeds, and oils. The whole movement of trade in Hamburg, including that in precious metals, showed imports to the amount of 3856 millions in 1900, and exports to the amount of 3309, thus giving the town the third place, beside Liverpool, in the trade of the world after London and New York. Great lines of mail-steamers connect Hamburg with every part of the world.

This development has increased the population of Hamburg to a degree that has overflowed the limits of the republic's small territory. The actual town of Hamburg, whose streets once lay between the Elbe and the basin of the Alster, has now grown inland until the whole expanse of the lake, divided by the magnificent Lombard Bridge, is enclosed by suburbs. On the north-east the town of Wandsbeck in Holstein is touched, and on the west, along the bank of the Elbe, Hamburg runs into Altona, which, although the largest town in Holstein and a busy manufacturing place, appears to be but one of its suburbs. If, besides some smaller places, we include the town of Harburg, the meeting place of the western railways, we shall find that the whole population of the busy economic aggregation that has crystallised around the old centre of Hamburg amounts to 1,000,000.

The long distance of Hamburg from the mouth of the Elbe gives special importance to the little territory of Cuxhaven, which was acquired by the free town as early as 1393, and whose signal light guides vessels on their entrance into the river; it also possesses a harbour for use in winter and in emergencies.

The immense strides made by Hamburg are no doubt due in very great measure to its geographical position. It lies at the south-eastern corner of the North Sea, the farthest point attainable by oceanic navigation, and at the opening of the greatest river system of Germany—a network of inland navigation the ramifications of which reach to Prague, Kosel, and Thorn, and run round and through the capital of the Empire. No wonder that no other German port can keep pace with Hamburg. There is only one which has bravely tried to do so: Bremen, the oldest of German sea towns. Bremen maintained its position of superiority up to the sixteenth century. Since that time, however, it has felt more and more keenly the disadvantage of standing on a smaller river, which neither brings down such large loads from the interior nor allows the largest sort of vessels to come up from the sea, fifty miles away, and which, moreover, being narrower, could more easily be closed by jealous neighbours. The town has held out bravely even against serious enemies, such as Sweden, which maintained a dominion over the lower reaches of the Weser, acquired in 1648—and true to the old motto, "Navigare necesse est; vivere non est necesse" ("Go in boats we must; live we need not"), has never permitted itself to be thrust back from the sea and its trade. In the nineteenth century the Weser, even though the tide comes up as far as Bremen, was found quite inadequate to bring up sea-going vessels, the size of which was constantly increasing, to the immediate vicinity of the town. Bremen was thus forced in 1827 to buy from Hanover a strip of land on the right bank, thirty-five miles lower down, and there to lay out Bremerhaven. The basins there hollowed out, whose number has lately been increased to five, are adapted for the largest possible ocean-going steamers. They are the workshop of the North German Lloyd, whose swift steamers go to America, Eastern Asia, and Australia. A relative diminution in the importance of Bremerhaven only resulted when Bremen itself again made efforts to take a larger direct share in sea trade. In the last ten years the channel of the Weser has been deepened to eighteen feet as far up as Bremen. Great new basins just below the old town were formed as a free-trade area when Bremen completed its adhesion to the German Customs Union in 1888. The number of ships, too, belonging to Bremen itself is especially remarkable, and is by no means so much behind that of Hamburg as its population is. A few figures from the statistics of 1901 will show what the importance of Bremen is to Germany in this respect:—

	Vessels.	Registered Tons.	Crews.
Bremen	566	833,860	14,755
Hamburg	918	1,443,976	21,544
Kingdom of Prussia	2082	417,926	11,525
German Empire	3883	2,826,400	50,556

Bremen is distinguished by the large average tonnage of its vessels. It is indeed in far-reaching oceanic traffic that Bremen stands out so honourably. The trade is mostly with the United States, not like that of Hamburg with Great Britain; and though the whole volume of traffic is less in Bremen, yet in some articles, in the imports of tobacco, rice, and cotton, Bremen takes the first place on the Continent, and in regard to the first two articles, the first place in the world. The character of Bremen's industries is regulated accordingly. They are partly connected directly with shipping, and partly employed upon imported materials such as cotton and jute. The great tobacco factories are scattered in villages far beyond the suburbs that have surrounded the venerable kernel of the old city with comfortable roomy villas, where it is possible to live in more ease and quiet than in the great urban bustle of Hamburg.

The Jade bay, an old estuary of the Weser, was chosen by Prussia in 1853 as a naval station. Wilhelmshaven grew up amid hard struggles with deceitful marsh fevers, storm-floods, and the continual silting up of the entrance to the harbour, which, while unapproachable for enemies, was not free from danger to its own ships. To commerce the place can never be of much importance, as there is no waterway from the interior to the bay.

In this respect the Dollart, an opening made farther west by similar incursions of the sea into the coast of Friesland, is greatly superior to the Jade bay. The Ems, indeed, is but a modest stream, running in a sandbed between extensive moors, and Emden, which was a flourishing trading town at the end of the sixteenth and beginning of the seventeenth centuries, has become a quieter place since the river turned away from it. A new era is at this very moment opening before this district of poor land and strong people. The completion of the canal between Dortmund and the Ems opens out what has been a quiet *cul-de-sac* into a main artery of traffic; and when the canal from Dortmund to the Rhine has been added, the waterway of the Ems will assume the importance of a mouth of the Rhine on German territory. New life may then animate the shores of the Dollart.

Westward of the Ems, in former centuries, before the moor-colonies had carried away great stretches of its upper surface of peat and brought the under surface into cultivation, the Bourtanger Moor used to be a great desert, a wide natural borderland, holding East and West Friesland apart, notwithstanding the common nature of their country and the likeness in race and speech of their peoples. This fact undeniably contributed to the separation of Germany and the Netherlands.

Note on Authorities.—An admirable monograph: *Die Länder Braunschweig und Hannover*, was published in 1867, and founded the reputation of its author, H. Guthe; the districts along the coast of the North Sea have never been better described.

A. Zweck published an account of Lithuania in 1898, and of Masuria in 1900.

CHAPTER XVIII

THE NETHERLANDS

It was not owing to geographical necessity but to historical developments that the western wing of the North German lowland, a district among the inhabitants of which German races largely preponderate, came to be politically separate. It appears as the last outcome—and the only one which has succeeded in attaining any permanence—of the repeated attempts to form a neutral and independent territory between France and Germany. At a period in which, roads being but ill developed, rivers formed the main arteries of communication, such an idea might very well be suggested by the prevailing northerly flow of the Rhine and the Meuse, corresponding in direction to the Saône and Rhone. Thus a girdle of communications ran across the continent, well marked off both from the convergence of the French waterways upon the basin of Paris, and from the natural lines of traffic that accompany the Danube and the southern border of the great lowlands. The Treaty of Verdun, in 843, created a State, Lotharingia, reaching from the North Sea to the Mediterranean between the above-mentioned rivers and the Alps. Although this State, with its union of widely divergent races and tongues, showed, from the first moment of its creation, no hope of long endurance, and in fact fell to pieces very quickly, the idea of it awoke again, when, in the fifteenth century, the Dukes of Burgundy, of a collateral line to that of Valois, became lords of the Netherlands. Their despotic rule succeeded for the first time in welding into unity the territory, hitherto totally disunited, which had fallen piece by piece into their hands. Under their rule the representatives of the different provinces came together for the first time in the assembly of the States-General, and soon felt themselves a power; for the policy of Charles the Bold sought its greatest support in the prosperity of these provinces, and after his death, his daughter, becoming altogether dependent on their help, was obliged to give them in the Great Privilege (1477) a large measure of political rights. Her grandson, Charles the Fifth, completed, in 1548, the severance of the long-weakened tie between the seventeen provinces of the Netherlands and the German Empire, and by means of the Pragmatic Sanction united them "indivisibly to all eternity" to the lands of the Spanish throne. Thus these districts, which had long been enriched by industrial activity, and had become the point of departure of a busy European commerce, were drawn into the trade of the wider world opened up by the discoveries of Spain. This was the great time of Antwerp. Wealth and power in the Netherlands had their centre of gravity in Brabant and Flanders. Their prosperous and healthy evolution was interrupted by the tyranny of Philip the Second, and by the war for freedom which it forced upon the Netherlands. This war tore the Netherlands into two territories which were thereafter divided. The north, sheltered behind rivers and flooded hollows, preserved its Reformed creed and its independence; its enterprising towns grew up, as Venice once did in the shelter of its lagoons, to be leaders in the trade of the world. The south, however, was again compelled to bow to the Spanish yoke, and, excluded by the Dutch from trade by sea, declined speedily from its condition of prosperity, especially after its territory had been diminished by French conquests and had been made the theatre of repeated battles. The respective developments of the Free and the Spanish Netherlands were thus too distinctly different for it to be possible that any Congress of Vienna should weld them once more into a single State. The year 1831 brought their division. The kingdom of Holland (12,740 square miles; 5 millions of inhabitants) and the kingdom of Belgium (11,370 square miles ; 6½ millions) subsist side by side as political and social organisms, having very different foundations of life and very different aims.

HOLLAND.

There is surely no other country in the world whose area, productivity, and international position have been so decisively affected by human wisdom and perseverance. From the hand of nature the Batavians and Frisians received but a poor, unfriendly dwelling-place. It had tracts of barely raised sand and marsh, dismal heaths with scanty trees, often inundated in their low-lying parts by wide sluggish rivers, and always threatened by the tides that beat upon the dunes ; its soil was unsteady and amphibious, and there was no substratum of solid rock. The dwellers on the coast engaged in incessant conflict with the sea, against which every inch of fertile marsh-land had to be suspiciously protected, and from whose dangers the fisherman had to wrest his gains, led a quiet existence shut out from that of the interior. To-day the richest nation of Central Europe dwells in magnificent towns upon these same sites.

The marshes upon whose pastures milch-cows graze, and whose fields, cultivated under a careful system of rotation of crops, produce abundant harvests, are sheltered from the sea and from the artificially regulated network of intersecting rivers and canals by solid dikes, with a perfect arrangement for letting off the water. The busy life, radiating from the great centres of commerce, demands for its subsistence so large a supply of all rural products, that high cultivation becomes remunerative even in the remotest regions of the little country, and enables a population much larger than that of the naturally similar districts in East Friesland and Oldenburg to live comfortably.

The kingdom, however, divides into several districts, marked by considerable economic differences. That which is most completely cut off is the north-eastern part, outside of the Rhine basin : West Friesland up to the Vecht. The strongest centre of genuine Frieslanders that still remains is to be found established here. Agriculture and cattle-breeding flourish on the soil cleared from the barren covering of peat.

The "geest" country on the south, up to the borders of Rhenish Prussia and Belgium, is intersected by the Meuse and by the arms of the Rhine. The conditions are not very favourable to agriculture, and the animals kept are mostly sheep. Large textile industries here begin to appear in many places, and to provide a living for part of the population. The most important towns lie at crossing-places of the rivers: thus, Maestricht, the chief town of Limburg, on the Meuse between Cologne and Antwerp, and Arnheim and Nimeguen respectively at the first bridges over the two arms into which the Rhine divides in Holland after leaving German territory at the busy border town of Emmerich. While Nimeguen marks the end of the diluvial plateau that runs northward between the Meuse and the Rhine, and so invites the road running in the same direction to cross the Waal at this point, traffic comes to the high right bank of the Lek at Arnheim. Here is the picturesque raised border of the barren Veluwe, the dry tableland of North Gueldres, situated between the Lek, the Yssel, and the Zuyder Zee.

The real "netherland," however, the country surrounded by the thickest complex of watercourses and cunningly protected against inundation, the seat of Holland's greatest international trade, is not entered until we reach, at Utrecht, the first of the four marsh provinces, which comprise but 27 per cent. of the area and 50 per cent. of the population of Holland. Utrecht, which is raised a little on the border of extensive hollows, was the most important town of this region before civilisation had completely subjugated it. Its name (Ultrajectum) is a reminder that, in the days of the Romans, the main branch of the Rhine ran by, and passing Leyden, reached the sea at Katwijk. This branch is now closed, and Utrecht is only joined to the Zuyder Zee by means of the Vecht. But, notwithstanding this change in the waterways, the significance of Utrecht is not altogether a thing of the past. The old university town, with its many towers, remains a centre of roads. As the key to the entrances both of South and North Holland, it is to-day, no less than formerly, distinctly the most strategically important point in the country. The isthmus between the Zuyder Zee and the Lek, over which Utrecht mounts guard, is but twenty miles wide, and the passage across it is impeded by watercourses on both sides of the town.

Near the western shore the dunes, presenting solid and dry soil, clear springs, and timber, invited settlers. 'sGravenhage was a hunting castle of the Counts of Holland among the woods of the dunes. Afterwards it became the royal residence of Holland, the Hague, a town on dry ground without piles or canals (*grachten*), situated amid lovely gardens and parks.

Leyden was a seaport as long as the Old Rhine broke through the dunes at this point. In later days, after its recovery from the severe siege, which it so heroically sustained, it owed a world-wide reputation to its university, and prosperity to its flourishing cloth-mills. Its decline in the eighteenth century was immediately followed by a diminution of population. Haarlem on the north was clearly destined by the springs of the dunes to carry on brewing, bleaching, and dyeing, and, in spite of many fluctuations, has maintained considerable prosperity. The horticulture of Holland, too, has its principal seat here.

But though so attractive and so rich in intellectual wealth, the three towns of the dunes have remained far behind the two great centres of Holland's sea trade, Amsterdam and Rotterdam. At the south-west corner of the Zuyder Zee there was a considerable creek running westward almost to the dunes of the coast—the Ij Here. When the Zuyder Zee was broken open by storms and high tides, and changed from an inland basin into a great gulf of the sea, this became a fine natural harbour. The catastrophe gave a place in international trade to Amsterdam, a little town—built on artificial foundations and on piles driven through the slush into firm ground—on the southern bank of the Ij and at the mouth of the Amster, a shallow and sluggish stream, coming northward from the country to the west of Utrecht. Amsterdam became a seaport, and was for a time affiliated to the German Hanseatic League. Its importance, however, remained limited until the war for liberty drove citizens of Antwerp and other towns to this securely sheltered spot. Though it had not even firm ground to stand on, the town grew with astounding rapidity. Here, in 1602, arose the East Indian trading company, the leader of colonial acquisitions in Malaysia. About the middle of the seventeenth century Amsterdam was the greatest trading place of the world, and kept the lead for several decades, even after the competition of England had increased into open enmity. The eighteenth century brought a pause, and its close a marked decline in trade, wealth, and population. Not until after the Congress of Vienna did Amsterdam begin to make progress again, and this progress had to be conquered by laborious struggles with the natural defects of the position, which were gradually becoming more and more felt. The entrance of the Ij was filled up with sand, and communication with the Zuyder Zee became more difficult. The whole basin, shallow as it is, was no satisfactory entering place for the enormous vessels of modern days. The *Venice of the North* did not, however, yield helplessly to being cut off from the great trade of the sea. It amazed the world by the North Holland canal, completed in 1825, which runs fifty miles northward through the marshes as far as Helder on the strait between North Holland and Texel. Not satisfied by this way, the Dutch in 1876, in westerly direction, opened the North Sea Canal in the dried-up bed of the Ij and across the dunes. The continual improvement of this waterway is still being carried on. On the other hand Amsterdam was connected with the districts at the mouth of the Rhine by means of the Merwede canal, completed in 1892, which gave the town a share in those advantages that had so much favoured the progress of her rival, Rotterdam. The vast works of modern water engineering have given Amsterdam fresh commercial prosperity.

The staple trade of the place is in Dutch colonial produce, but it also receives large quantities of wheat, timber, coal, petroleum, and wine, which it passes on into the interior. The export trade deals with Dutch dairy products despatched to England, and more largely with commodities from the German hinterland.

The free communication with the hinterland will always give Rotterdam a great advantage ; the town itself lies upon the north bank of the Lek, but a branch of the Waal, which runs in higher up, makes this the destination of commerce from both arms of the Rhine. It is true that the German towns of the Rhine more and more send their own vessels to foreign shores. The traffic of Rotterdam is, however, constantly increasing. The town shares with Antwerp the inestimable advantage of lying directly opposite to the estuary of the Thames, and is in the near neighbourhood of the Straits of Dover, the gate of international trade. It surpasses Antwerp by lying nearer to the sea, and having behind it the vast basin of the Rhine.

The leading position of Rotterdam is assured beyond all question by the manner in which the southern part of the Rhine delta is broken up into a number of islands, upon which only places of limited influence could arise. Only the most south-westerly island of the archipelago of Zealand, Walcheren, has had its conditions of life altered by the railway that links it with North Brabant. The advantages of this change, however, are not reaped by Middelburg, the old capital of Zealand, which lies in the centre of the island, but by Flushing, the excellent and rising harbour on its southern shore at the mouth of the Scheldt. This is an important starting-point of passenger traffic with England. The great mart of trade, however, has lain since the time when the Dutch ceased to be able to close the Scheldt, not here on the projection of the mainland, but at Antwerp, the innermost point of the estuary that can be reached by sea vessels. The southern bank of the wide estuary also belongs to Holland, and so does Sluys, on the other side, the old port of Bruges.

While the natural endowments of Holland are in quite a unique degree all of one kind, those of Belgium are more varied in character. In part this country recalls the conformation, the forms of settlement and of labour, of the Prussian Rhine province, with its poor and barren mountain country and its thickly peopled districts of industry. Very different from the social and political life of Holland, running in placid grooves, is the struggle of nationalities and parties by which the politics of Belgium are disturbed. In one particular only is Belgium the more closely united, and that is in religion. The counter-reformation here achieved a complete conquest. The country is as Roman Catholic as Spain or Italy, and resembles them too in the extremely low state of public education.

BELGIUM.

The poorest part of the country is the south, the Forest of Ardennes, in the provinces of Luxemburg and Namur. Here there are considerable areas in which the density of population falls below 100 to the square mile. Between the lonely farmsteads, which are united into very large communes, lie little towns, which make centres of slight communication and markets for the products of the high lying and not very profitable land. Of the valleys, whose deep and winding furrows run up into the highland, only that of the Meuse, which passes quite across, is wide enough to carry a considerable roadway as well as the waterway.

Namur is the point at which this transverse valley ends, and falls into the important longitudinal cutting of the valley of the Sambre and Meuse.

At the point where the Meuse changes its north-eastward for a northerly direction, and where four tongues of the highland, divided by three tributaries, send their respective roadways down to the crossing-place of the river, Liège arose in the early Middle Ages. It was the first place upon the Continent to open out and work its coalfield. Metal-work was one of the main branches of industry, even in the mediæval city, whose prosperity was destroyed by the Burgundians. Only our own iron age gave it a new impulse. Coal-mining and gun manufactories are the principal forms of industry of this great town, and of its ring of suburbs, which extend westwards up to the iron-foundries of Seraing, and eastwards in a loosely linked chain as far as the cloth-mills of the frontier town of Verviers. North of the town the existence of a rich bed of lead and zinc ores has made the division of the borderland of Altenberg (Moresnet) so difficult that the district is held in common by Belgium and Prussia, and forms one of the most remarkable peculiarities of the map of Europe. The combination of the Devonian formation, from whose strata the iron of the region also comes, and of the coal measures, together with the favourable situation, gives so dense a population to the neighbourhood of Liège that there are more than 400,000 inhabitants in 120 square miles. The presence at the extreme limit of French-speaking territory of a city rich in historical memories, and possessing a university and a technical college, gives a centre of culture to this region, and raises it above that of Hainault, which extends for forty miles, from Charleroi to Mons (Bergen). Here again an area of about 190 square miles supports more than 400,000 persons. The coal-mines, which are here obliged to go deeper than elsewhere, and penetrate more than 5000 feet into the earth in order to reach the seams that lie below the covering cretaceous formation, form the foundation upon which iron-foundries, glass-works both for blown and plate glass, and a number of other industries have been raised. The thick network of railways is not sufficient for the vast transport of goods. Canals connect Charleroi with Brussels, and Mons with the main arteries of the Scheldt basin, and thus both with Antwerp and Northern France.

The great increase of population in these industrial districts of South Belgium, due in part to immigration, has tended to increase in a remarkable degree the share of French nationality in the Belgian state without altering the local boundary of the tongues. The border-line between the French and the Flemish languages the provinces of Hainault and Liège towards Flanders and Limburg; but in the south of Brabant it extends as far as the battlefield of Waterloo. The French portions of the upper town of Brussels, together with its one entirely French suburb (Ixelles), form an enclave of French speech in the Flemish country. The social conditions are here very different. The earth affords no mineral wealth upon which industries native to the soil could arise. Thus the population of Limburg, which is mostly occupied with agriculture, is comparatively thin, and does not collect into townships of any great size. In Brabant we find the beginnings of the Belgian textile industry, which was the earliest of its kind on the Continent, and which, in the course of its famous history, has dealt with every attainable material, and reached a high degree of efficiency in every branch undertaken. The point, however, which is the distinguishing characteristic of Brabant is its central position in the interior of Belgium. This it was which decided the Dukes of Burgundy in their choice of a capital for their possessions in the Netherlands. At the expense of Liège, which they destroyed, and of Bruges, whose independent spirit resisted them, they raised into prominence Brussels, which lies between these towns. Brussels, situated between the sea and the Meuse, between the Rhine and the Ardennes, was particularly well adapted to become a centre of many radiating railway lines. It was less favourably placed in the matter of communication by water. But the need of getting coal from the Sambre caused a canal to be made from Charleroi. On the north, the Senne, which was by nature only large enough for little boats, marked the line for a connection by canal with the mouth of the Scheldt. The old inland town will be practically transformed into a seaport.

The river Scheldt unites the waters of the greater part of the Belgian lowland. It could not often happen that a river whose source lies but 100 miles from its mouth, while the lands watered by it do not much exceed traffic. The river system of the Scheldt shows four approximately parallel rivers, which at one time were perhaps united in pairs. The Antwerp mouth clearly corresponds to the eastern pair of rivers, the Rupel (Senne) and the Dender; whilst the Braakman, an inlet of the shore which appears to be an extinct mouth, corresponds to the western pair, the Scheldt and Lys (Leye), which meet at Ghent. As far back, however, as we have any trustworthy historical records, the course of these rivers has always turned eastward from Ghent to join the other rivers on the east. All four rivers are navigable nearly to their sources, and are connected with French waterways.

The tide rises in the Scheldt as far as the lock-gates of the canalised reach at Ghent. Even in the Middle Ages, and at the beginning of modern times, this town had a shorter connection with the sea by means of canals that ran to the north and north-west, and at the present it takes a direct share in the marine trade by means of an artificial waterway to Terneuzen. At the opening of the modern period, Ghent was perhaps the greatest manufacturing town in the world. Its 40,000 weavers were the nucleus of the military power that defended its independence. The old parts of the town, intersected by canals and lying between the Scheldt and the Lys, still show the character of that period of prosperity. It came to an end when the Netherlands were divided, and the southern provinces which had remained under the dominion of Spain, were excluded by Holland from the sea trade. Its ranks were then thinned by the emigration of many of its citizens. Not until the nineteenth century did new life return with the cotton trade. The industrial life of the present day, contented with very small returns, is in strong contrast with the monuments of the past.

The old towns of Bruges and Ypres, seats of the linen and lace trades, retain but a shadow of their former greatness. Bruges was the first place in the Netherlands that attained a far-reaching importance. In the thirteenth and fourteenth centuries, its port was the chief seat of the Netherlands trade with Western Europe and the Mediterranean, as well as with England and the Hanse Towns. Here flourished the earliest manufacture of cloth, whose wares travelled over Germany and out into Sclavonic lands, and from whose example other nations learned the trade. Of the pride and self-confidence exhibited by the citizens of Bruges, not only in regard to their commerce, but also in regard to politics, the decline of the city has left nothing remaining. Outstripped by Ghent as early as the fifteenth century, and by Antwerp in the sixteenth, international trade gradually abandoned it, as its communication with the sea grew worse, while, on the other hand, the demands of sea-going vessels in the matter of depth and space of water were rapidly increasing. None of the efforts that have been made in modern times to effect a practicable sea communication have so far succeeded in bringing fresh life to the place.

This retirement of the trading towns of Flanders from the maritime commerce which they once carried on, causes it to be completely concentrated in Antwerp, the most important of Belgium's ports. The reason why this harbour at the mouth of the Scheldt, although it dates back to the early Middle Ages, did not enter into competition with the western places which stood far ahead of it until the fifteenth century, and why it so suddenly became their superior, is to be found in an advantageous change in its relation to the sea, which only appeared in the fifteenth century. Of the two estuaries of the Scheldt which run around the islands of Beveland and Walcheren, only the East Scheldt had, up to that time, been navigable for sea-going vessels—a long waterway with a wide curve towards the north. It was owing to storms and high tides at the beginning of the fifteenth century that the coasts of the Netherlands were changed, and that the West Scheldt and the Hond, until then narrow and shallow entries, so widened and deepened as to open a shorter way from the sea to Antwerp. The full advantages of this improvement came into play when the Portuguese discoveries changed the old course of eastern trade, and the wares of India came to Central Europe, no longer by way of Venice, but by the Atlantic Ocean. Antwerp became the chief seat of oriental trade, and its inclusion in the empire of Charles V. directed to it also the stream of goods from the New World. The pen of Guicciardini has pictured Antwerp in this period of brilliance. It was but short. Its submission at the time of the heroic struggles for freedom was of bad omen for Antwerp. Shut off by the Dutch from maritime trade, the town withered away under the rule of the Habsburgs, until at the dawn of the French Revolution the mouth of the Scheldt was once more opened to the trade of the city. Great docks were built by Napoleon, and the trade by sea received a new impulse, paving the way for further commercial progress. A hindrance, indeed, was put in its way when Belgium became independent, in the shape of Dutch duties, levied on the Scheldt until the year 1863. But the progress of Antwerp was not now to be checked. It is, at the present day, the largest town in Belgium, a seaport with a wide hinterland. Among tropical products india-rubber predominates so largely, since the opening up of the Congo State, that Antwerp now does perhaps a larger trade in that commodity than any other town. Internal communication is served, not only by a railway system with many branches—the lines from Paris to Amsterdam and from Ostend to Cologne cross here—but also by an abundance of waterways.

A characteristic to be noted in considering the relation of Belgium to the sea is the weakness of its own mercantile marine, about one-tenth of that of Holland. Thus, while in the ports of Holland the national flag still holds an honourable place, second only to that of Britain, and in Amsterdam but a little second even to that, the harbour of Antwerp is mainly filled by foreign shipping.

In the same way that the great Dutch ports have

in front of them, as outposts for passenger traffic, the Hook of Holland and Flushing, so Ostend lies in front of Antwerp, and the steamers plying between it and Dover convey more than 120,000 passengers a year. This mail line gives Ostend the second place among the ports of Belgium, ahead even of Ghent. Ostend is also the headquarters of the Belgian sea-fishery.

The North Sea is the theatre of the common activities of the fishing fleets belonging to all the surrounding nations. Each of them considers that a certain strip of sea, extending three sea miles outward, measured from the low-water mark on its shores and from a straight line drawn so as to connect headland with headland on each side of bays that run inland, is an integral part of its own territories, reserved for the use of the dwellers on its own coasts. Within these territorial waters, to which belongs, for example, the whole of the Zuyder Zee, a fairly rich harvest is gathered from the sea. The shallows of the sandbanks that are exposed by the low tides retain, behind their fences or in their remoter hollows, small fish and mussels that are easily collected. The same sandbanks are the seat of an oyster-fishery and oyster beds of considerable importance, yielding valuable returns both on the western coast of Schleswig and in the Netherlands, but especially in the province of Zealand. Fishing with draw-nets and with the line, however, is also profitable in these waters close to the coast.

Fishing in the open sea is left to the free competition of all the surrounding nations. But as among the different methods employed trawling interferes with drift-net fishing and with line-fishing, with its thousands of ground lines, the States interested agreed, at the suggestion of England, to a series of police rules, ratified by a convention at the Hague in 1882, for the regulation and protection of their fisheries on the high seas. One principal site of this fishery is the Dogger Bank, off the east coast of England. Next to the English, who supply the largest contingent to the fishing fleets at this place, the Dutch take the chief part, that of Germany and Belgium being much smaller. This competition in the fisheries is certainly valuable to all the nations concerned, not only for the sake of the food-supply thus obtained, but as a school for their seamen.

Note on Authorities.—The most authoritative works upon Holland are H. Blink's *Nederland en syne Bewoners*, 3 vols., 1887–93; and *Tegenwoordige Staat von Nederland*, 1897.

A general account of Belgium, the joint-production of several distinguished men, is given in *Patria Belgica, Encyclopédie Nationale* 3 vols., 1873–75.

CHAPTER XIX

COMMUNICATIONS

CENTRAL EUROPE is not so fortunate as to be immediately surrounded by water, but is enabled to take part in international traffic by means of its four seas opening in different directions. The importance of these depends not only upon their size and the nature of their junction with the great oceans which are the arena of the world's commerce, but also upon the degree to which they penetrate into the land, and admit sea traffic into the interior of the Continent. The Adriatic hardly allows any access at all. Steep shores and rugged mountains arrest the course of sea-vessels; the Narenta alone opens to them her sluggish lower reaches as far as Metkovits. Very different is the stretch of country opened to seafarers by the navigability of the Lower Danube from the Black Sea. The chief harbours upon it for sea-ships lie nearly 100 miles inland, while sea-going vessels of the smaller kind have often ascended nearly to the Iron Gates. In the Baltic there is no place much over forty miles from the coast which is accessible to sea-going ships. The full oceanic tide is only felt by Central Europe along the shores of the North Sea, but the head of the tideway far inland does not mark the end of the traffic. Cologne (180 miles from the sea) is the farthest point upon the Rhine to which ships from the sea come up in great number, and the size of the vessels is here limited not so much by the depth of the river (10 feet), which might easily be doubled, as by the inadequacy of the Dutch channel.

There is hardly another spot among the seas of

Europe to be compared with that junction of traffic at the south-western angle of the North Sea where the mouths of the Thames, the Scheldt, the Meuse and the Rhine converge, near to the entrance of the English Channel. Subordinate only to this is the south-eastern angle of the same sea. Here not only ends the largest river system of the North German lowland, but also opens the passage to another sea, the Kaiser Wilhelm Canal, navigable for ships of the largest size, making a line of connection between Brunsbüttel at the mouth of the Elbe and the port of Kiel. This canal was completed in the years between 1887 and 1895, and is the greatest achievement of modern canal-building. Of its 63 miles of length, only six coincide with the basins of natural lakes; its depth is 30 feet, its width 72 feet at the bottom, and 190 feet at the water-level. The doubt whether the work would ever repay the costs of its construction caused many decades to go by before it was carried out. Although the new free port of Copenhagen keeps for the Sound—as was to be expected—by far the greater part of the traffic, the inlet of Kiel has also become a busy exit from the Baltic.

For heavy ladings such as go by sea, internal waterways still remain very useful. The Netherlands for this reason possessed a vast advantage in having their country intersected by a network of rivers, and in being easily able to give closer meshes to the net by means of canals. Even if we disregard smaller ramifications, the whole length of navigable waterways in Holland amounts to 4875 miles. Belgium, with 1375 miles, comes next in this respect, but its nature made the cutting of artificial waterways more difficult. These two countries, the combined navigable watercourses of which happen to amount to just one-fourth of the circumference of the globe, fall in this particular but a little below the totality of the German Empire, which has 8750 miles, and still less below the great territory of Austro-Hungary with 7220 miles.

Towards the interior of the continent, not only do irregularities of conformation increase, but the value of waterways is limited by the greater severity of the winter. In laying out artificial waterways these characteristics have to be reckoned with. It is precisely, however, in extensive inland districts where distances are very great that the cheapness of water carriage for heavy goods is most fully felt. Owing to this cheapness alone it becomes possible for Upper Silesia to smelt Swedish ores, and for Mannheim to distribute Roumanian corn over South Germany. The farthest internal ports of Central Europe, to each of which more than 50,000 tons of goods are annually brought up by natural waterways, are Strassburg, Heilbronn, Frankfort, Dortmund, Hameln, Prague, Berlin, Kosel, Thorn, Elbing, Königsberg, Tilsit, and in the Danube basin Ratisbon.

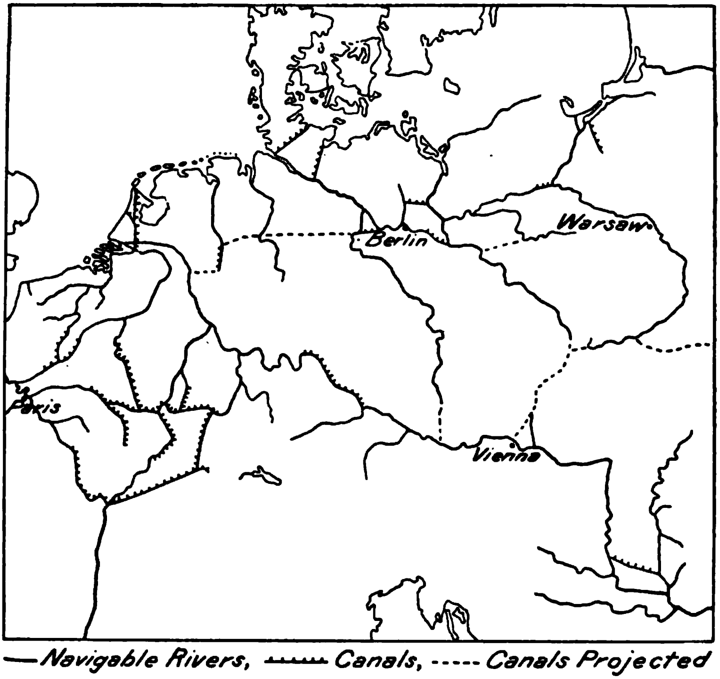

FIG. 38.—The Waterways of Central Europe.

Along that section of the Danube which follows the southern border of the mountains of Central Germany there are several points which invite the opening of transverse waterways across the principal watershed of Central Europe. The idea which occupied the enterprising mind of Charlemagne has been carried into execution between Bamberg and Kelheim, where the courses of the Regnitz and the Altmühl have been connected by means of the Danube and Main canal, which is 110 miles long and 4 feet deep, and crosses the watershed at a height of 1440 feet. Canals from the Elbe and the Oder to the Danube are projected and already approved by the Austrian Parliament. The opening of the Danube and Oder canal will result in a vast interchange of commodities between the industrial districts of Upper Silesia and the fruitful plains of Moravia and Hungary. For the present, however, in the matter of water communication in Central Europe the Mediterranean basin is absolutely and completely divided from the basin of the Northern Seas. For in the same way that the Ludovic Canal between the Danube and the Main must be reckoned useless for communication on a large scale, so the Rhine and Rhone canal between Mülhausen and Montbéliard has ceased since the restoration of Alsace to Germany to carry more than an insignificant traffic.

The great activity of Germany in the improvement of waterways has been confined to the connection of neighbouring river systems running in the same direction upon the northern slope. Even in this department much remains to be done. While on the east of the Elbe a twofold communication with the Oder exists, and a single one to the Vistula, there is an absence on the west of any transverse communication between the Elbe and the Rhine. The Prussian diet has recently rejected the Government proposal to construct two canals by which the lately completed waterway from Dortmund to the mouth of the Ems would be connected on the east with the Elbe at Magdeburg and on the west with the Rhine. The plan has doubtless not been definitely laid aside. It will revive, for prosperous districts with a great future before them demand its execution, and are ready to make sacrifices for it.

The interest in the care of water communications, which has been so marked during the last twenty or thirty years, was called forth by the great interchange of commodities due to increased economic activity. Railways alone no longer seemed to be sufficient, in spite of the unquestionable advantages which had secured to them the first rank in methods of communication. They are less dependent upon climate and upon the configuration of the country; freer in their choice of route, and therefore better adapted to meet most of the needs of traffic. The railway system of the Central European States extends to 63,000 miles, but the closeness of its web varies enormously. While the whistle of a locomotive has never yet echoed through the mountains of Montenegro, and in Servia and Bulgaria there are but 1½ miles of railway line to 100 square miles of country, the same area is traversed in Saxony and in the kingdom of Belgium by 32 miles, and in the coal basin of the Ruhr by as many as 55 miles.

As the railways had to replace the old highways, they often followed the track of these, but the rapidity of their steam-progress allowed them to choose the easier country, even when this involved a considerable détour. Where the larger mountain-chains rise, main lines run along their edges. The most conspicuous example is the way in which the line between Marseilles, Geneva, Vienna, Cracow, and Odessa, both termini of which might be reached from Vienna in some thirty-six hours, makes a curve to follow the long folded mountains. In the great lowlands the railways develop freely, guided rather by their distant destinations than by the slight irregularities of the ground, and forming junctions chosen quite arbitrarily. Less numerous, and more carefully selected and laboriously prepared are the ways by which railway communication penetrates into the mountains. By preference it follows the long lines of valley that keep one direction, like those of the Rhone and Rhine, or the longitudinal valleys which in the Eastern Alps divide the central zones from the Limestone Alps on the north and south, or, again, like the curve of the Waag and the furrow of the Servian Morava.

Of those railways which follow the same direction as the Eastern Alps and pass through the longitudinal valleys, the line from Vienna to Bregenz, which runs between Tyrol and the Vorarlberg and is important for the connection of the Austrian Alpine districts, has the hardest task, for it must pass beneath the mighty barrier of the Arlberg by means of a tunnel 6.4 miles long. The difficulties of construction were as great as on transversal lines crossing the Alps.

It is not often possible to carry the line over an Alpine pass, and the boring of a tunnel is the plan generally adopted. Even then it has to be decided whether a short tunnel shall be pushed through the upper part of the main ridge, and an open railway, struggling to defend itself against the snowstorms of winter, shall rise into the valley head, or whether the difficulty of this shall be evaded by the boring of a very long tunnel, so that the train may remain in the gentler climate of the lower levels. The second method has generally been preferred, notwithstanding the increased cost of a very long tunnel. The task was first undertaken by engineering science when the railway was built which was to replace the old crossing of the Alps from Savoy to Piedmont at the Mont Cenis, by a tunnel 7.6 miles long beneath the Col de Fréjus, fourteen miles farther to the west. The work, begun in 1857 by the kingdom of Sardinia alone, was completed, with the assistance of France, in 1871.

This line of communication between Lyons and Turin is soon to be supplemented by a line of more value to Paris from Geneva to Milan. The piercing of the Mont Blanc group was for some time under consideration in connection with this scheme, but it was finally decided to carry a tunnel of 12.3 miles through the Simplon.

The completion of this tunnel, the longest yet constructed, is expected to occupy eight years, and the engineers engaged upon it expect to find the temperature in the heart of the mountain rise to about 104° F. The great length of this tunnel will ensure favourable conditions of climate at the exits, which are placed as low as 2100 and 2200 feet above the level of the sea.

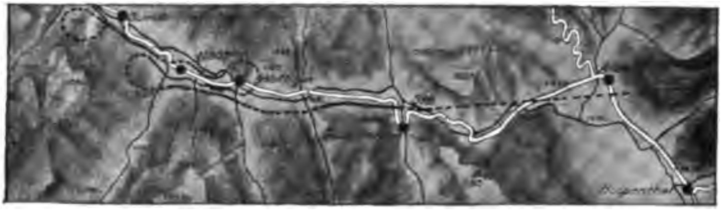

FIG. 39.—Loop Tunnels of St. Gothard. Approach to the Great Tunnel from the North.

The most important previous tunnel was that which, since the year 1882, has connected Göschenen in the Reuss valley with Airolo on the Ticino. It is nine miles long, passes not only under the watershed of the St. Gothard ridge, but also under the upper part of the Reuss valley, and forms the shortest way from Zürich to Milan, and so from the whole of West Germany to North Italy. This great work, which is of incomparable importance in the history of railway engineering, required other difficult constructions in the neighbouring valleys, in particular spiral tunnels, which were obliged

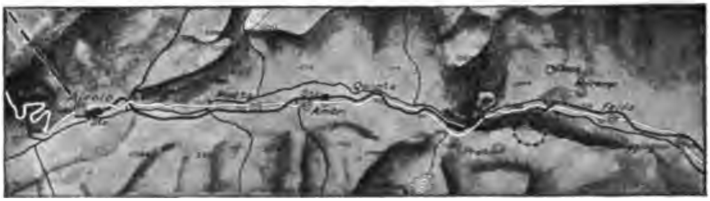

FIG. 39A.—Loop Tunnels of St. Gothard. Approach to the Great Tunnel from the South.

to describe a wide curve in the heart of the mountains in order to overcome the difference in the level of their exits, which lie very near together, but above and below each other. The St. Gothard Railway revives the direct communication with Italy, and makes Genoa a port for West Germany. For these reasons Italy and Germany contributed largely to the cost of its construction, although the whole of the line belongs to the Swiss territory.

The direct line of the St. Gothard railway, running at right angles to the ridge of the Alps, will always give it an advantage over the Simplon railway, which runs in a diagonal line through the mountains, so as to join the longitudinal valley of the Rhone. It will have the same advantage over the schemes which at present are but talked of, that would take two lines obliquely across the Rhætian Alps, the one continuing the Albula line, already building, through the Ofenberg to Mals, and the other from Partenkirchen to Chiavenna, through the Fern Pass and Maloggia. Tirol, since 1867, has been crossed by the Brenner line, which rises slowly along slipping slopes to the top of the pass. As the long-desired tunnel under the Tauern, to connect Salzburg with Carinthia, is to-day only in construction, the outermost eastern wing of the Alps must for the present content itself with two railways, the Pontebba line (from Vienna to Venice) and the so-called Southern line (from Vienna to Trieste), both of which cross the principal watershed at low-lying saddles, and find their chief difficulties more to the north, the one in the gorge of the Enns, the so-called "Gesäuse," and the other at the Semmering. To the tunnel beneath the latter pass the line rises from Lower Austria with many much-admired contrivances of tunnels and viaducts.

To the six railways which cross the Alps must be added those on the east coast of the Adriatic, which intersect the mountains from Agram to Fiume, and from Sarajevo to Mostar. In the case of the latter the tunnel under St. Ivan's pass presented fewer difficulties than did the passage through the terrible mountain gorges of the Narenta, which had never before been traversed by a road. The closeness of the Carpathian chains, too, gave to the bold lines connecting Buda-Pest with Oderberg, Tarnov, Przemsyl, Lemberg, Czernowitz and Bucharest a picturesqueness of surroundings that is often comparable with those of the mountain lines in the Alps.

The fact that even the highest and most difficult mountains of Central Europe have railways running through them, while immediately beyond its borders in the Russian empire lie stretches of flat, easy, and singularly fruitful country where lines of railway are few and far apart, marks the sharpness with which the border-line on the east of Central Europe divides one civilisation from another.

To compare the rapidity of different railway systems is not very easy. Only to stretches of approximately similar length can the same standards be applied ; hindrances increase with distance. Nor must the delaying influence of foreign customs boundaries be forgotten; in Central Europe, so politically broken up, these sometimes play a greater part than does the difference between flat and mountainous country. If we are to distinguish the maximum achievements of different countries, the first place must unquestionably be accorded to the "flying Scotsman," which does the 395 miles between London and Edinburgh in 465 minutes, thus attaining a speed of 51 miles an hour. Even on the much shorter runs from Berlin to Hamburg, from Berlin to Breslau, and from Vienna to Budapest the high speeds of 49.4, 44.0, and 43.2 miles are considerably below this. On longer distances, comparable with that between the British capitals, the speed per hour of the quickest trains on the German main lines is about 40 miles, and in Austria about 38 miles. The trains of Central Europe, with these rates, are equal with those of France, and considerably ahead of those of other Continental countries. Isochronic maps showing the distances reached in every direction in equal times serve very well to bring out for different centres of traffic the speed of their communications. That of Berlin gives an instructive example.

A casual glance at the network of railway lines might give the impression that man had now become completely master of the surface of the earth, and that all parts of it were equally covered by the web of iron threads. But as we make a closer inspection and distinguish more clearly the value of the different lines, we soon perceive that the old main lines of direction marked out by nature as channels of communication have not lost their importance. It is evident that so long as man does not succeed in making the atmosphere serve as his medium of travel, so long as human intercourse has to cling to the surface of the earth, and to remain ex-

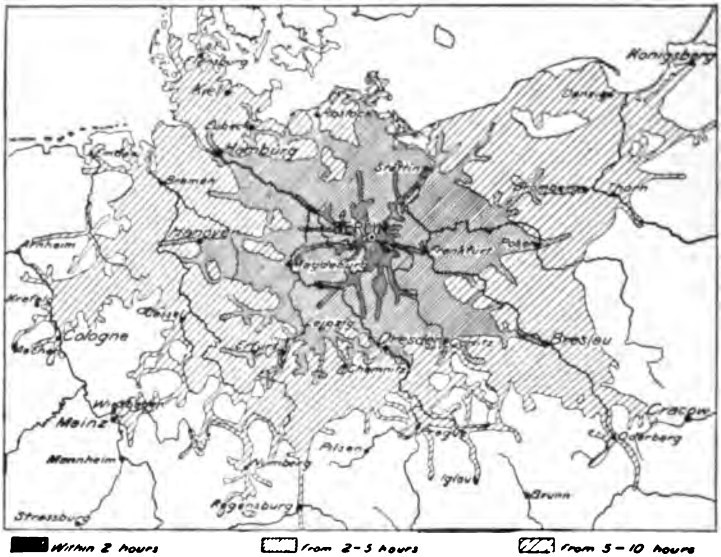
Königsberg
Danzig
Kiel
Rostock
Lübeck
Hamburg
Emden
Bremen
Stettin
Thorn
Berlin
Hanover
Arnheim
Frankfurt
Posen
Magdeburg
Krefeld
Cassel
Cologne
Leipzig
Erfurt
Dresden
Breslau
Chemnitz
Wiesbaden
Mainz
Cracow
Oderberg
Pilsen
Nürnberg
Mannheim
Iglau
Brünn
Regensburg
Strassburg
Within 2 hours
from 2-5 hours
from 5-10 hours

FIG. 40.—Showing Lines of Equal Time Distance by Express Train from Berlin. (After Mary Krauske.)

posed to its friction, the map of communications will show geographical features, and will never cast off a certain dependence upon the conformation of the country. This is the more certain because the positions of the principal centres are not arbitrary, but mostly determined by the distribution of mountains over the land, and by the way in which the surface is divided. Such centres arise at the line of division between traffic by water and traffic by land, generally at the point inland which cannot be passed by vessels from the sea; for example, on the steep coasts at the inner corner of the gulfs of Genoa, Trieste, and Fiume, or on the shallow banks of the lower parts of the great rivers. In the interior, foci of communication arise at points that form natural centres of countries and districts shut off from their surroundings, either on every side, like Bohemia and Hungary, or at least on several sides, like the inlets of the lowland at Cologne, Leipzig, and Breslau. In addition to these, places at which great well-marked natural lines of communication cross are sure to become of special importance, and so are those at the entrance to narrow and busy passage ways. The most striking examples of this kind are Vienna and Frankfort-Mayence, but Basle, Geneva, Graz, Belgrade, and Sofia are also instances. Spacious plains offer a larger choice of situation for such centres; the choice of junctions so important as Berlin and Munich has been decided by historical developments that partly depended upon chance. A special group is formed by centres of population to which mineral treasures give an independent productive power of their own. As an artesian well bored in a desert will create an oasis, so the discovery of mineral treasures that long lay unsuspected under a tract of country will raise it in a few decades to life and activity, while wealth arises from unnumbered shafts to bless the inhabitants. All the great mining districts of Central Europe exhibit this spectacle, but in none is there a more striking example of the difference between past and present than in Upper Silesia. In all these cases new centres arise which throw into the shade the old capitals of the neighbourhood, and the net of old trading roads disappears beneath the thicker web of modern communications.

The electric lines, by which thought travels, are freer from local necessities. Central Europe is covered by a network of telegraph wires whose total length amounts to 600,000 miles, and these have been further and usefully supplemented during the last few years by telephone lines to about two-thirds that length. The conversations carried along these telephonic channels are certainly not less than 1000 millions in a year, and have greatly assisted to accelerate and intensify commercial activity. Nothing can more effectually strengthen the power of great commercial and industrial centres than the rapidity with which a word uttered in Berlin can be heard in Copenhagen, Bordeaux, or Budapest. It seems as if the human voice, the most direct expression of human will, were no longer subject to the bounds of space.

The electric current gives to the whole civilised world of our day a common life of thought and emotion, as if the whole were but one single great organism. Even in the depths of the ocean the cables carry their messages from shore to shore. The British Isles are the centre of this trans-oceanic intercourse of thought. English enterprise and capital have enriched most parts of the world with this new means of mutual comprehension. It is natural, however, that the various countries should seek gradually to emancipate themselves from a monopoly of this means of communication. Central Europe has already made the first steps. Emden, the point from which the German cable starts for England, now has direct communication with Spain (Vigo), and with the United States.

Note on Authorities.—No up-to-date geography of European traffic exists.

Ample material lies scattered in different technical journals which seldom fall into the hands of a geographer.

For an elucidation of Fig. 40, which is taken from the *Festschrift des Geographischen Seminars der Universität Breslau*, 1901, the reader may be referred to Francis Galton. He was the first to suggest the construction of "Isochronic Passage-charts" (*Report of the* 55*th Meeting of the British Association*, 1881. *Proceedings of the Royal Geographical Society*, N.S., iii., 1881), and to draw them up for London.

CHAPTER XX

THE GEOGRAPHICAL CONDITIONS OF NATIONAL DEFENCE

CENTRAL EUROPE is full, at the present day, of a rich and civilised life. It has blossomed in the sunshine of peace, and only under this star can go on prospering undisturbed. But a love of peace on the part of the populations who inhabit it is not all that is necessary. Central Europe has been the battlefield of foreign peoples, the object and the prey of conquering neighbours, and can never forget that constant thought and constant labour are necessary in order to be ever ready in defence of its soil and its industry. There is no other part of Europe whose position, in case a fresh military period were to set the world in flames, would be so much threatened as would that of Central Europe. Who can dare to say that such dangers as were undergone by Ferdinand the Second and Frederick the Second may not once more befall the powers of Central Europe? Would they be strong enough if the cry "Enemies all around" were once more to compel them to lay their hands to the sword? In answering this serious question geographical facts take a decisive part, and invite us to survey the means of defence along the frontiers.

The western border of Central Europe is that which has undergone most variation during recent centuries, and has been the subject of most recent conflict. Here, even in the present day, is the most serious point of tension. In opposition to the French efforts at expansion, which at one time succeeded in setting back this frontier as far as the Baltic, the European Powers took measures, at the Congress of Vienna in 1815, to protect Germany, which, owing to its divisions, was at that time weaker than it is now. Switzerland and the kingdom of the United Netherlands were created as buffer states. The neutrality secured to these was also promised in 1832 to the newly formed kingdom of Belgium. The value of this protection on both flanks of the western frontier of Germany does not depend solely upon the security of international agreement and the doubtful readiness of the guarantors to protect this neutrality by force of arms. The neutral states themselves have shown, by the measures of self-defence which they have undertaken, that they are not disposed to let themselves be involved without resistance in the quarrels of their neighbours. It remains, however, somewhat uncertain whether they would have resolution enough to throw their defensive power quickly and emphatically into the balance against the invader of their neutrality.

This is all the more doubtful, because the temptation not to respect neutral territory only arises when a strong militant power has already obtained considerable advantages and its superiority begins to be decisive. As long as both adversaries face each other in the fulness of their power, neither could venture, unpunished, to turn the flank of the other by crossing a narrow strip of neighbouring neutral country. But when the strength of the two parties begins to be unequal, the stronger may attempt by thus reaching across to hasten the final decision, and to protect itself against reverses. In any case, it is obvious that Germany could never have anything to gain by taking this course. Aix-la-Chapelle lies 264 miles distant from Paris and Metz 200 miles, and the way through the fortresses of the Sambre to Paris is not easier for a German attacking army than that by way of Verdun. Nor could a march through Switzerland give any greater advantage to German troops. Why should they expose themselves to the difficulties and dangers of crossing the Swiss Rhine country and the Jura, when beyond these great obstacles they would still find themselves confronted by the same French fortifications that directly touch German territory at the gate of

Belfort? Nor could an alliance with Italy ever lead Germany into the error of taking an army to be useless in the blind alley of Switzerland, shut in by the Jura. It would be madness to purchase a co-operation with Italy on Swiss ground by an invasion of Switzerland, for an expedition north of the Alps would demand far greater powers than Italy could ever spare from her home defences.

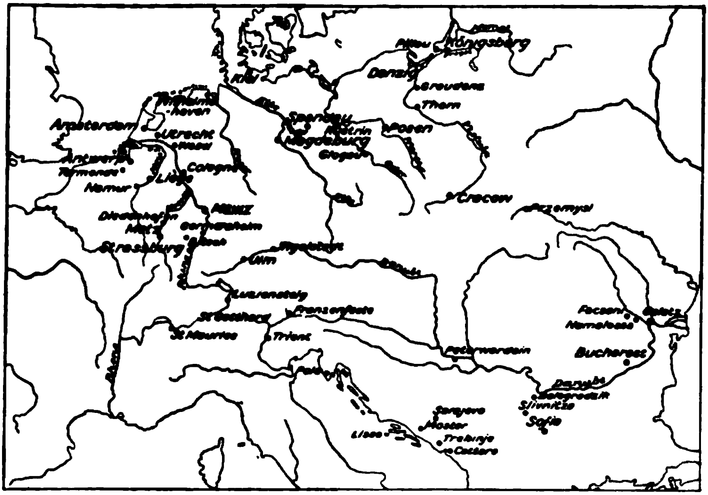
Memel
Pillau
Königsberg
Danzig
Graudenz
Thorn
Kiel
Amsterdam
Utrecht
Antwerp
Termonde
Namur
Liége
Cologne
Spandau
Küstrin
Posen
Magdeburg
Glogau
Cracow
Przemysl
Mainz
Metz
Germersheim
Strassburg
Ulm
Ingolstadt
Luziensteig
St Gotthard
St Maurice
Franzensfeste
Trient
Peterwardein
Focsani
Galatz
Nemolassa
Bucharest
Danube
Belogradchik
Slivnitza
Sofia
Sarajevo
Mostar
Lissa
Trebinje
Cattaro

FIG. 41.—The Strongholds for the Defence of Central Europe

With France the case is different. If the defensive power of Germany should be diminished along the Rhine, either by reverses or by the requirements of some war at a distance, France might hope, by advancing through Belgium, to enter Germany at the less protected northern end of the west frontier, to combine operations with its own navy, and in case of a simultaneous attack from Russia, to strike the severest blow at the enemy, who would lie between two hostile forces. Or if the German army of the Rhine were weakened and obliged to confine itself to defending the fortifications, the advance of a French army through North Switzerland into the heart of South Germany might be even more tempting. These are the possibilities which the neutral states have seriously to keep in mind in the preparations for the defence of their neutrality. The defensive preparations of Switzerland, at any rate, seem to be guided by quite other views, and to propose a resistance in the inmost parts of the territory. Immense sums are being expended upon the forts that surround the St. Gothard, and are turning the Urserenthal and the cross roads of Andermatt into a vast fortified camp. The entry to the great longitudinal inner Alpine valley is closed at the western end of Valais by the forts of Bourg St. Maurice, and the Rhine valley on the east is secured near Ragatz by the fortress of the Luciensteig. The passes of the Jura, the defence of which is rendered more difficult by the fact that French territory extends to near the Lake of Geneva, are thought to be sufficiently closed by means of mines. A French attacking army, coming along the eastern foot of the Jura, could best be resisted, in the first place, at the strong position on the right bank of the Limmat and the Aar. The whole result, however, would depend upon the attitude taken by the Swiss military forces. If they were content to observe, events would sweep over their heads. The whole salvation of Switzerland would depend upon its making a firm stand for the complete inviolability of its territory.

While that country has natural defences against the foreign invader in its mountains, its rapid and abundant rivers, and its broad lakes, the natural position of Belgium is not so secure. Its territory is intersected by the military road along the Sambre and the Meuse that has been used in so many wars. In any conflict between the two adjoining powers, the shortest line between the objectives of the operations on both sides, Paris and Berlin, would pass along it, and would lead through rich highly cultivated country, offering relatively little natural hindrance. It is, therefore, of extreme importance that Belgium has not, like Switzerland, contented itself with preparing a refuge for its military power, as far as possible from the border, but has closed the line of the Meuse at the very frontier by the great fortified places of Liège and Namur, which bar the way against both Powers. The chief strength of Belgium would not, however, be stationed here, but would be collected in a great fortress lying aside from this line—Antwerp. This position offers the advantage of being protected on the south by the line of water formed by the union of the rivers Nethe, Rupel, and Scheldt. Beyond these rivers, the most important crossing-places of which are fortified, lies the circle, nine miles in diameter, of Antwerp's fourteen new forts, which have quite altered the character of an old fortified place that used to depend upon a ring of waters. The forts are especially strong towards the sea. It is obvious that the choice of this spot—which indeed is by nature well adapted for defence—has been in part decided by the hope of help from without. And indeed England's policy could never suffer any of the great Continental Powers to gain a firm foothold exactly opposite to the Thames, and, as Pitt expressed it, "to hold a pistol to England's breast."

The example of this strong fortification of the environs of Antwerp may have contributed to make Holland prepare its national defences with so much insight and caution. As in former centuries, the strength of Holland still lies in the great expanse of country that can be flooded. This protection is only lost in very severe winters, such as that of 1794–95. The "new water-line" from the Zuyder Zee to the Lek, protected by Utrecht and a number of smaller fortifications, is, together with its continuation to the junction of the Meuse and Waal, Holland's principal line of defence towards the east; while, on the south, rivers that widen into real arms of the sea forbid any hostile approach. Safely sheltered behind this protected belt of waters lies the principal fortress of the country, Amsterdam, surrounded by a wide ring of forts and a territory within its own power to inundate. The surrounding defences are completed by the fort of Ijmuiden at the entrance to the North Sea

Canal, and by the forts around Helder, which close not only the entrance to the North Holland Canal but also that to the Zuyder Zee, and so prevent the passage towards Amsterdam of hostile ships or of materials for a siege.

The peaceful dispositions and the good state of defence of its three neighbours on the west are of great importance to Germany in the task of defending its 150 miles of frontier against France. The acquisitions of the last great war, which restored the losses of centuries, altered the conditions of national defence fundamentally and to the advantage of Germany. Whereas the former frontier used to be the Rhine, which served to conceal the military preparations of France, and whereas the fortress of Strassburg used to be a direct menace to the safety of South Germany, the river, from Basle to the frontier of Holland, is now once more entirely in the hands of the Germans. If there were danger of war, the line of the Rhine would cover the strategic advance of the German forces. Between Basle and Mayence the river is crossed upon German territory by eleven railway bridges and sixteen pontoon bridges. Beyond the river, Upper Alsace is covered by the broad and wooded mountains of the Vosges; and where these mountains end, and the Saar basin is bordered by low hills, eight lines of railway run from the reach of the Rhine between Strassburg and Cologne towards the westward projection of the frontier of Lorraine. The newly acquired line of the Moselle is here protected by the mighty fortress of Metz, the new forts of which form a circle round the town five miles in diameter, and more to the north, close to the frontier of Luxemburg, by Diedenhofen. It would be between Metz and the northern end of the Vosges, as a glance at the railway map will show us, in front of the Saar and behind the Seille, that the main defending force of Germany would probably collect. Military writers consider the fields round Lunéville and Nancy as the probable scene of the first decisive action in any future war. Its result would decide whether an advance upon the first French line of defence, supported by the Upper Moselle and Meuse and by the great fortresses of Epinal, Toul, and Verdun, were possible for the German army, or whether the French could open their advance upon the Rhine towards the great places of Strassburg and Mayence.

If the neutrality of Belgium were to be violated by France, Cologne would become the central point of defence, and in the course of the last twenty or thirty years nothing has been spared to bring its fortifications into the best and most modern condition ; the importance of Wesel, too, has not been forgotten. If an advance should be made through the Gate of Belfort and North Switzerland towards the interior of South Germany, the French would indeed find, if they avoided the fortified places of Breisach and Istein, that the whole reach of the Rhine which lies between Germany and Switzerland, from Basle up to Constance, is unprotected ; but the modernised fortresses of Ulm and Ingolstadt would oppose a barrier, and even under great difficulties would secure time for the German military leaders to collect sufficient forces on the Danube, or to carry out serious operations against the enemy's communications.

Any attack upon the western frontier of Germany would probably, in the present preponderance of the French navy, be accompanied by a threatening of the German coasts. The experiences of the last war should not lead to the underestimation of this danger. In the North Sea, the shallows impede the approach of hostile vessels. Nothing, however, has been left undone in the defences of the naval station of Wilhelmshaven, and of the mouths of the rivers Elbe and Weser. The acquisition of the Island of Heligoland is of ambiguous value. While this little rocky islet remained in the hands of England, Germany might at any time have had the annoyance of seeing a hostile fleet collect there, but now that it is protected by German batteries it makes an outlying point open to the first attack. The mouth of the Elbe has become a more important place since it received the North Sea and Baltic Canal. The two extremities of the canal are in the middle of Kiel Harbour, and is covered by strong fortifications at its entrance. To protect its course through Holstein, if it were threatened by a force that had landed, say, in Jutland, would be more difficult.

The coasts of the Baltic, owing to their extent, are inconvenient to fortify, and are not so naturally difficult of approach as the shallows of the North Sea. The best protection here consists in a line of railway running along the coast, and ready to carry help to any point threatened. The important commercial inlets, however, are fortified, or else ready to be closed by torpedoes in case of war. Fortunately the large towns lie far back, out of danger of bombardment, a good way up the mouths of rivers, and in some cases at the end of broad haffs. Two of them, Dantzig and Königsberg, are already among the strongest defensive positions along the eastern frontier.

If France were to conspire with the giant Empire of the east for the destruction of the German Empire, it would help to bring about its own ruin and the slavery of its future generations. The unlimited growth of the Russian Empire, and the disturbance of the balance of power in the interior of Europe to the advantage of Russia, which already contains more than a quarter of all the inhabitants of the Continent, do undoubtedly constitute a danger to the whole Germanic, and also to the whole Latin world. The danger is but little lessened by the consideration that there are no grave interests in dispute between Russia and Germany. While it is certain that Germany will never covet a square mile of Russian soil, no one can answer for it that the Russian Colossus, in its unceasing expansion, may not some day attempt once more to push its western frontier forward. No natural barriers, difficult to cross, protect Germany on the east. Only the power of the German people to defend itself can protect this boundary.

The task is rendered more difficult by the length and its retreating curve to the westward. The frontier measures 750 miles from Memel to the Three-Emperors Corner at Myslowitz, and while the direct line from the eastern ends of East Prussia and Silesia passes through Warsaw, the Russian territory on the Middle Warta pushes so far westward that Berlin stands at a distance of only 180 miles from the frontier. This wedge of Poland points menacingly towards the German capital, and leaves the military strength of Russia free to choose upon what part of the long frontier line it will direct the full force of its onset. East Prussia, surrounded on the south, east, and north by Russian territory, exposed on the north-west to the attack of the Russian Baltic fleet, is connected with the main body of the Empire only by a length of 75 miles and lies in the greatest danger. The first effort of any Russian attack would be to paralyse this wing of the Prussian eagle. If the armies of Germany were compelled to act on the defensive here, they would find their task lightened only along the southern border, where there are woods and the tangled waters of Masuria. Between the long lakes with their many arms, the roads have to go across narrow passages which would be easy to defend, even if the closing of them had not been prepared in time of peace, by building little forts like Fort Boyen at Lötzen. For great hostile undertakings this tract of country is in any case less suitable. The natural lines of Russian advance are the broad valleys of the Pregel and the Vistula. The Russian railway system has prepared, in the junctions of Vilna and Warsaw, points of departure for both these lines of attack. The fortifications of Kovno, at the crossing of the Niemen, form a base from which an army which was not opposed by an equal force would find the way open through the Pregel district as far as Königsberg. A wide ring of forts has of late years made this place into a fortress of the first rank, which cannot be fully surrounded so long as the Frische Haff with its fortified entrance, the Pillauer Deep, are not in the enemy's hands. With Königsberg as a base, a lesser Prussian army might maintain its footing upon the island of the coast between the Haffs and the mouths of the Pregel, whose branches fall into them; or, stationed behind the Deime and the Alle, such an army could protect all East Prussia. Its situation would only be seriously endangered if a Russian army from the Vistula were to gain a decisive success, and to cut East Prussia's communications on the west. The strong fortifications on the line of the Vistula have been erected to meet this danger. Thorn, in particular, has a large ring of detached forts commanding both banks of the river, and able with an energetic and active garrison to extend their influence north-eastward, as far as the Prussian lake country, and south-westward as far as the lakes of the Upper Netze. Only 30 miles further to the north lies Graudenz at the head of an important bridge, which has recently been strongly fortified, and lies half-way between Thorn and the delta of the Vistula. The area of the delta ready for inundation strengthens the position of Dantzig, which the forts on the western hills and at the mouths of the river have made into a spot most capable of being defended. It is connected with Königsberg on one side by the Frische Haff.

With the great military strength which Russia has at command, it would undoubtedly be possible that, simultaneously with an invasion along the Pregel and Vistula, an advance should be attempted towards Berlin. The advancing army on the left bank of the Vistula would be threatened on the flank by Thorn, and could not go on until it had completely invested this fortress; but if it did succeed in reaching the eastern border of the province of Posen, it would come into a country much cut up by long lakes running from north to south and offering many positions favourable to the defence. Beyond lies the reach of the Warta that runs northward, and upon it the strong fortress of Posen. Here the lines of communication from all the eastern portions of the Empire converge. An interruption of these communications, by the surrounding of Posen, would be a heavy blow which the German military leaders would have to use every exertion to prevent. The wide ring of forts and the modern methods of construction give to Posen a great power of resistance to a siege, the materials for which would have to be brought from a great distance and by very difficult roads. Taken together, Königsberg, Dantzig, Thorn, and Posen form a ring of fortresses that enclose a natural division of territory and greatly enhance its powers of defence. The line of the Oder is of but secondary importance. Since the razing of the defences of Stettin, it has possessed but one strong fortress, Cüstrin, which has outlying forts, and stands at the embouchure of the Warta in a considerable area of easily flooded country. South of the Obra Bruch, which connects the Warta and the Oder, and bounds the sphere of influence belonging to the fortress of Posen, lies but one fortified place, at the head of a bridge, Glogau. Silesia is less important for the purpose of protecting the eastern frontier. It does not lie in the natural line of a Russian advance, and is in some degree defended by the far projection eastward of the Austrian Empire.

The whole conditions of national defence along this eastern frontier, with its unfavourable peculiarities, suggest that this border cannot be satisfactorily held on the defensive, and that serious injury can only be averted by a vigorous offensive. In the eastern provinces where no river runs, like the Rhine, parallel with the frontier, making a basis of defence, the place of some such basis would have to be supplied artificially by railway lines running along the border. The carefully laid out system of communications has everywhere created two, and sometimes for long distances three, independent lines of railway running parallel with the frontier, and these—if satisfactorily secured against destructive attacks by bodies of Russian cavalry—would render possible a rapid displacement of troops. They can, however, only be so guarded by a considerable advance of German troops. As the different size of the areas to be covered and the differences in railway development in the two empires would undoubtedly assure to the Germans the advantage of being more quickly ready for battle, it is obvious that Russia must reckon, in case of war, upon taking up at first a purely defensive attitude. She has prepared for it by constructing the square of Polish fortresses — Novo Georgiewsk, Ivangorod, Brest-Litewski, and Goniondz—which will enable her to collect her forces behind the great river frontage of the Bobr, Narew, Bug, and Vistula, and there to await with confidence the approach of any attack. Warsaw has also been made into a stronghold.

This conception of the position depends upon the paucity of railways, economically so much required in the great district on the left bank of the Vistula. Russia trusts for protection, even in this first stage of a war, to her superfluity of space, and to that "fifth element" which Napoleon discovered with terror—the unfathomable mud of the roadway, which paralyses the most active strategy and tires the most valorous soldiers. The offensive side of national defence therefore presents serious difficulties to Germany. But the rich cultivation and increased population of Poland have in the course of a century changed the character of the battlefields, and deprived Russia of the exceptional position which she appeared to occupy after the experiences of Napoleon. The Russian Empire cannot be regarded as so invulnerable and so unapproachable for hostile troops at the present day as it was in 1812. The method of defence which was possible then cannot be repeated.

Calm and expert judges are inclined not to overestimate the danger of a war with Russia. Much would of course depend upon whether Germany had to bear all the weight of it alone, or whether it could reckon on the aid of its present ally, Austria-Hungary. The position of that power in regard to Russia is essentially different. The greater part of the Empire is sheltered by the Carpathians. Only Silesia, Galicia, and the Bukovina stretch down into the plain of Eastern Europe, and absolutely demand an armed defence against their great neighbour.

Three railways lead from Moravia and five from Hungary into the district where the Oder rises, and into the basins of the Vistula and Dniester. Of these railways, six debouch into the valleys of the Vistula and San, behind which the principal defensive force would have to assemble, supported by the two great fortresses of Cracow and Przemysl, which are connected by two independent lines. Use could also be made of the lines in the valleys of the Waag and the Hernad, deep in the mountains, if troops had to be carried from one side to the other. The choice of two points of concentration at only 150 miles apart bears witness clearly enough to the conviction that a strip of land so long, and at the ends so narrow, as the outer border of the Carpathians from Teschen to Czernowitz (400 miles) can only be defended by forces held well together, and ready to take the offensive. The attraction of the enemy by a strong army serves better than a dispersion of forces to secure districts that lie at a distance. While the army of Cracow in a well-chosen position would face towards the Polish seat of war, and at the same time be ready, in case of an alliance, for co-operation with the German forces, the army of Przemysl and Lemberg would be required to advance towards Volhynia and Little Russia. In consequence of the division of the country into a northern and a southern field of operations, separated by the great marshy district of the Bug and the Pripet, this army would choose an independent aim, namely, Kiev.

While the great Powers of Central Europe, if compelled to take up arms in defence of their eastern frontier, would obviously try to carry the decisive action into the enemy's country, Roumania, weaker in regard to Russia, both owing to its position and to the conformation of its frontier, could only hope to protect itself by a resolutely defensive attitude; its task would be to find means of holding in check the overwhelming power of its neighbour until help came. The line of the Sereth suggested the construction of fortifications here, the principal centres being Focsani, Namalossa, and Galatz. The fortification of the capital, Bucharest, is on an equally large scale. The great sacrifices which Roumania has made for the defence of its independent political position show that it understands the lessons of the near past, and that it is becoming a valuable pillar of the existing group of Central European states.

It is not possible to speak with the same certainty of Bulgaria and Servia, which are turning their measures of defence against each other. It is clear that not only the new fortifications of Slivnitsa and Belogradzik near the frontier, but also the protection of Sofia by the four forts now in course of construction, are the result of the Servian attack in the year 1885. The old square of fortresses in Eastern Bulgaria between the Danube and the Balkan, which played so famous a part in the world's history (Rustchuk, Silistria, Shumla, and Varna), would appear to have no future importance. The significance of Widdin, too, sank with the fall of the empire whose northern border it had so long protected.

On the other hand, the political and military importance of Bosnia and Herzegovina have increased since Austria-Hungary took its first step this way on the road towards Salonica. That the road may be stubbornly disputed the Government is perfectly aware. Even the retention of what has been already gained is opposed by the Great Servian agitation originating in Montenegro. A conflict between Austria and Russia would fan it into open insurrection in Herzegovina. The Austrians are preparing for all eventualities. Besides numerous little forts and blockhouses, they have built three great fortresses with detached forts at Sarayevo, Mostar, and Trebinye, and have facilitated the dominion of the country by an admirable development of the road system. In particular, they have surrounded with well-chosen fortified posts Montenegro, the hotbed of disturbances, which has long felt as an oppressive chain the strong defences at the Bocche di Cattaro. Time has not softened the mutual antagonism. The moment of outbreak is awaited. The nature of the country, unusually favourable to guerilla warfare and to the preservation of bands of insurgents, would make any contest for supremacy long and trying. None of the rose-coloured reports that are spread, and that in a measure fit Bosnia, can charm away this danger that threatens Herzegovina. Austria here holds a wolf by the ears.

In such circumstances—and they exist in Dalmatia too and darken many a corner of it—it becomes very important to Austria that her fleet should rule the Adriatic. Its principal stations are at Cattaro, the island of Lissa, and the fine military harbour of Pola in Istria.

Along the Alpine frontier the old tension between Austria and Italy has ostensibly died down since the existence of the Triple Alliance; but the openly expressed desire of the Italians to possess the Trentino keeps awake the watchfulness of Austria.

Although preparations are thus made for defence on the four faces of Central Europe and are continually perfected to meet the requirements of the times, we may, on the other hand, perceive in its interior a striking diminution of the friction between one state and another which was formerly so marked a defect. A general view of the defensive measures of Central Europe in the present day brings out, as at no previous time, the essential unity of this great civilised region. Among all the alliances of our day, that between the two great Central European Powers is the most natural and has the strongest internal guarantees of permanence. If these two continue to hold together, not only will their smaller western neighbours be enabled, under the protection of their swords, still to enjoy prosperity and security, but the unruly peoples between the Adriatic and Black Seas will also learn to value and enjoy the blessings of peaceful industry. Central Europe has been the battlefield of all nations long enough to resist a recurrence of such sufferings with all its might and by a united movement of its millions of trained soldiers. May the great monument on the battlefield of Leipzig, where the criminal effort to enslave a whole continent was defeated, not by military skill, but by the elemental power of liberty-loving nations, remain the last memento of the political errors of previous centuries, a warning to all ambitious tyrants in the future, and an admonition to the peoples of Central Europe to remain united, to keep peace, and to command peace.

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